Vol. 896 Number 3

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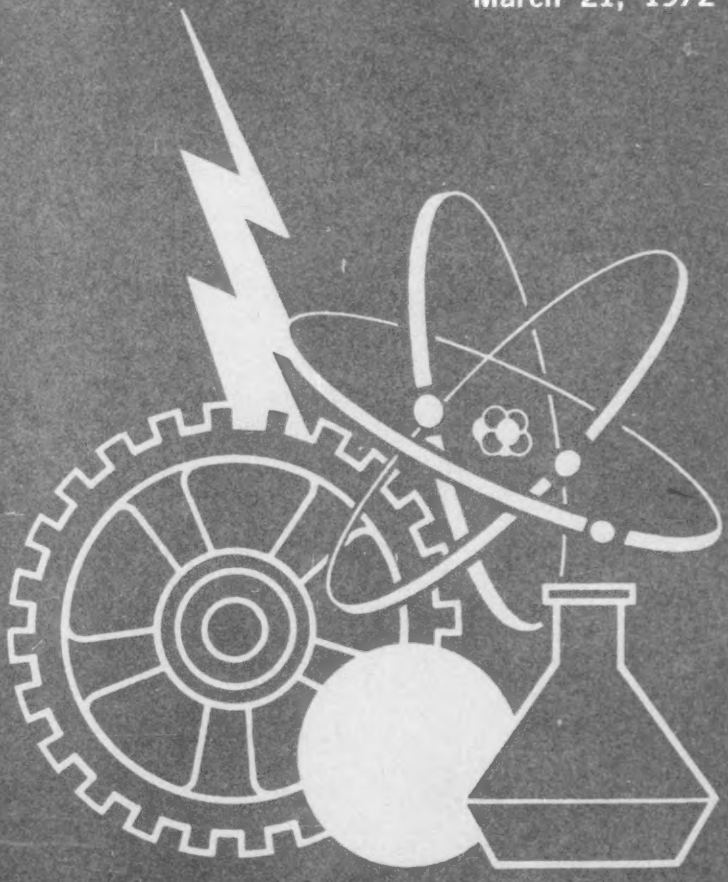
PATENTS

March 21, 1972



U. S. DEPARTMENT OF COMMERCE
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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

March 21, 1972 Volume 896 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Miscellaneous Amendments

A proposal was published at 36 F.R. 19315 to revise §§ 2.54, 2.67, 2.87, 2.88, and 2.187. Pursuant to this notice, comments have been received from interested persons. Full consideration has been given to all matter presented and changes in the text of the original proposal have been made in view thereof.

Section 2.54 is being revised to permit the Patent Office to accept substitute drawings in appropriate situations.

The revision of § 2.67 clarifies the situations in which an examiner may suspend action on an application.

Sections 2.87 and 2.88 are being revised to state that both goods and services may be the subject of a single application or certificate of registration in accordance with section 30 of the Trademark Act of 1946. Additionally, § 2.87 requires five specimens be submitted for each class.

The revision to § 2.187 insures that the certificate of registration issues to the current owner of the mark.

Effective date. This revision shall become effective March 17, 1972.

In consideration of the foregoing and pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), Part 2 of Chapter I of Title 37 of the Code of Federal Regulations is hereby amended as follows:

1. Section 2.54 is revised to read as follows:

§ 2.54 *Informal drawings.*

A drawing not in conformity with §§ 2.51 to 2.53 may be accepted for purpose of examination, but the drawing must be corrected or a new one furnished, as required, before the mark can be published or the application allowed. The necessary corrections will be made by the Patent Office upon applicant's request and at his expense.

2. Section 2.67 is revised to read as follows:

§ 2.67 *Suspension of action by the Patent Office.*

Action by the Patent Office may be suspended for a reasonable time for good and sufficient cause. The fact that a proceeding is pending before the Patent Office or a court which is relevant to the issue of registrability of the applicant's mark, or the fact that the basis for registration is, under the provisions of Section 44(e) of the Act, registration of the mark in a foreign country and the foreign application is still pending, will be considered prima facie good and sufficient cause. An applicant's request for a suspension of action under this section filed within the 6-month response period (see § 2.62) may be considered responsive to the previous office action. The first suspension is within the discretion of the Examiner of Trademarks and any subsequent suspension must be approved by the Commissioner.

3. Section 2.87 is revised to read as follows:

§ 2.87 *Combined applications.*

An application also may be filed to register the same mark for any or all of the goods and/or services upon or in connection with which the mark is actually used and which fall within a plurality of classes. However, dates of use for each class, five specimens for each class, and a fee equaling the sum of the fees for filing an application in each class are required. A single certificate of registration for the mark may be issued.

4. Section 2.88 is revised to read as follows:

§ 2.88 *Applications may be combined.*

(a) When several applications have been filed by the same applicant for registration on the same register of a mark shown in identical form on the drawings for goods and/or services in different classes and each of the applications has been allowed, a single certificate based on such applications may be issued. A request for the issuance of a consolidated certificate must be made of record in each of the applications involved prior to the allowance of any of the applications.

(b) The issuance of any original certificate may be suspended upon request of the applicant, for a period not exceeding 6 months, to permit such consolidation.

5. Section 2.187 is revised to read as follows:

§ 2.187 *Certificate of registration may issue to assignee.*

The certificate of registration may be issued to the assignee of the applicant provided the assignment is recorded in the Patent Office at least 10 days before the application is allowed, and written notice of the recording of the assignment and the address of the assignee is made of record in the application file by the applicant or assignee.

Dated: February 14, 1972.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 72-2684; Filed 2-23-72; 8:46 a.m.]

Published in 37 F.R. 3897, Feb. 24, 1972

Delayed Printing of Plant Patents

Plant Patents dated to issue on October 5, October 12, and October 19, 1971, were omitted from publication in the OFFICIAL GAZETTE on the above dates due to the unavailability of full color reproductions. Normal publication of Plant Patents will resume with the issue of March 28, 1972.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,734,226, W. H. Willert, INJECTION MOLDING APPARATUS, **filed** Dec. 6, 1971, D.C., S.D. Ohio (Dayton), Doc. 4162, *Egan Machinery Co. and William H. Willert* v. *Trueblood, Inc.*

2,804,401, B. A. Cousino, MAGNETIC SOUND TAPE, **filed** Nov. 8, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2679, *Faraday, Inc.* v. *RCA Corporation.*

2,936,899, P. Tashman, TRAY OR PAN CABINETS, **filed** Dec. 14, 1971, D.C., S.D. Fla. (Miami), Doc. 71-1890-C-JLK, *Precision Metal Products, Inc.* v. *Brunor, Inc. et al.*

2,974,055, W. G. Scharf, LUSTROUS FABRICS AND METHODS OF PRODUCING SAME, **filed** Aug. 19, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70C1037, *Metal Film Co., Inc.* v. *Warrior Mfg. Co., Inc.* Order of discontinuance, Dec. 8, 1971.

3,004,422, R. M. Starrett, KEY HOLDER, **filed** Dec. 13, 1971, D.C., S.D.N.Y., Doc. 71-C-5423, *Swank, Inc.* v. *New York Merchandise Co., Inc.*

3,005,038, W. A. Donohue, HIGH TEMPERATURE RADIO FREQUENCY CABLE AND METHOD OF MAKING THE SAME, **filed** Dec. 2, 1971, D.C. Colo (Denver), Doc. C-3575, *Tasker Industries* v. *Kaman Sciences Corporation et al.*

3,032,054, D. W. Irwin, PRESSURE REGULATOR CONSTRUCTION, **filed** Dec. 10, 1971, D.C., S.D. Iowa (Des Moines), Doc. 11-450-C-2, *Rockwell Manufacturing Company* v. *Fisher Controls Company, Inc.*

3,003,578, W. F. Hofmeister, CHAIN ADJUSTMENT FOR TRAVELING WATER SCREENS, **filed** Dec. 22, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-3021-IH, *Compac Corporation* v. *John B. French, doing business as Better Built Engineering.*

3,122,484, H. P. Iskenderian, REACTOR HAVING FUEL ELEMENT COATED WITH BURNABLE POISON, **filed** Dec. 10, 1971, D.C., S.D.N.Y., Doc. 71-C-5404, *Block Drug Company, Inc.* v. *Global Imports, Inc.*

3,228,212, A. Huber, METHOD OF HAND KNITTING AND KNITTING NEEDLE, **filed** Dec. 13, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2965, *The Grant Co. et al.* v. *W. T. Grant Co. et al.*

3,252,587, B. T. Scales, PNEUMATIC-HYDRAULIC SHOCK ABSORBERS, **filed** Nov. 24, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71–1112, *Brian T. Scales* v. *Pittsburgh Forgings Company.*

3,265,177, K. Knickerbocker, COIN OPERATED VENDING MACHINES, **filed** Nov. 10, 1971, D.C., M.D. Fla. (Tampa), Doc. 71–508–C, *Kaspar Wire Works, Inc.* v. *LECO Engineering and Machine, Inc., Gulf Machine and Grinding, Inc.*

3,269,862, Lanza and Stivers, CROSSLINKED POLYVINYLIDENE FLUORIDE OVER A CROSSLINKED POLYOLEFIN, **filed** Dec. 10, 1971, D.C. Mass. (Boston), Doc. 71–2939–W, *International Telephone and Telegraph Corporation* v. *Raychem Corporation.*

3,273,090, J. Malin, MAGNETICALLY OPERATED SWITCH, **filed** Dec. 3, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71C1562, *Alarm Device Mfg. Co.* v. *Alarm Prod. Intl. Inc. and Orlando Tresorras.*

3,277,234, Dekko and Carter, ELECTRICAL RECEPTACLE FOR MOUNTING IN A PANEL, **filed** Dec. 16, 1971, D.C., N.D. Ind. (Fort wayne), Doc. 71–F–140, *Lyall Electric, Inc.* v. *E.M.F. Corp.*

3,338,059, J. G. Tittle, METHODS AND APPARATUS FOR ENTRENCHINC SUBMERGED ELONGATE STRUCTURES, **filed** Nov. 23, 1971, D.C., S.D. Tex. (Houston), Doc. 71–H–1351, *Brown & Root, Inc.* v. *Houston Contracting Company.*

3,382,280, C. W. Huffman, 3',4'-DICHLOROPROPIONANILIDE, **filed** May 7, 1968, D.C.N.J. (Newark), Doc. 447–68, *Monsanto Company* v. *Chemical Insecticide Corp.* Action terminated administratively, Dec. 3, 1971.

3,395,237, H. S. Orton, ELECTRIC RESISTANCE FURNACE, **filed** Dec. 6, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71–1148, *Harold S. Orton* v. *Robicon Corporation.*

3,439,450, S. J. Richards, POROUS BLOCK FOR CONSERVING SOIL MOISTURE, **filed** Nov. 30, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2838–DWW. *The Regents of the University of California* v. *Gordon A. Chapman, doing business as El Sombrero Sales.*

3,511,036, R. A. Julian, LAWN RAKING TOOL ATTACHMENT FOR ROTARY BLADE TYPE LAWN MOWERS, **filed** Nov. 23, 1971, D.C., E.D. Mich. (Detroit), Doc. 37443, *Robert A. Julian* v. *Mich. Production Grinding Co.*

3,511,464, B. L. Doll, CORNER PAD AND BLANK, **filed** Dec. 14, 1971, D.C., W.D. Va. (Charlottesville), Doc. 71–C–35–C, *Cellu Products Company* v. *Brown Products, Inc.*

3,516,500, J. M. Brighton, POWER SKIDS, **filed** Dec. 2, 1971, D.C., M.D. Fla. (Orlando), Doc. 71–249–Orl–C, *Pemberton-Durham, Inc.* v. *Von Engineering Company.*

3,545,017, H. M. Cohn, ENCAPSULATED LIFE JACKET, **filed** Nov. 22, 1971, D.C., N.D. Ohio (Cleveland), Doc. 71–1155, *H. Marvin Cohn* v. *Kransco Manufacturing Co.*

3,577,763, J. O. Beal, APPARATUS FOR SELECTIVELY PROGRAMMING DIFFERENT TYPES OF SHOCK TESTS, **filed** Nov. 17, 1971, D.C., N.D. Tex. (Dallas), Doc. CA–3–5290, *Frank Kirmss* v. *Jarry S. Oakes, Performa Corporation and Tallyho Plastics, Inc.*

3,611,601, Stropkay and Stropkay, ROTATING WHEEL TIRE DISPLAY, **filed** Dec. 1, 1971, D.C., N.D. Ohio (Cleveland), Doc. C–71–1190, *Product Design & Manufacturing Corp.* v. *McNeil Corporation.*

3,618,895, J. J. Van Gompel, SPREADER FOR DAMAGED CORES, **filed** Dec. 10, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2951, *Brammall, Inc.* v. *W. A. Johns Paper Co.*

Certificates of Correction for the Week of Mar. 21, 1972

D. 221,706	3,592,800	3,602,328	3,607,802
D. 222,309	3,592,892	3,602,448	3,607,842
3,386,945	3,593,055	3,602,535	3,607,957
3,465,461	3,593,196	3,602,943	3,607,965
3,503,213	3,593,733	3,603,005	3,607,968
3,516,796	3,594,863	3,603,123	3,608,015
3,521,786	3,595,141	3,603,405	3,608,051
3,526,542	3,595,249	3,603,411	3,608,285
3,539,886	3,595,372	3,603,677	3,608,493
3,553,709	3,595,504	3,603,742	3,608,662
3,563,133	3,595,733	3,603,761	3,608,706
3,564,040	3,595,865	3,603,792	3,608,809
3,564,080	3,595,916	3,603,942	3,608,828
3,564,162	3,595,945	3,604,306	3,608,840
3,564,979	3,596,002	3,604,325	3,608,861
3,565,152	3,596,484	3,604,338	3,608,968
3,566,236	3,596,535	3,604,353	3,608,969
3,566,522	3,596,653	3,604,874	3,609,076
3,578,695	3,596,751	3,604,903	3,609,193
3,579,574	3,596,877	3,604,922	3,609,197
3,579,730	3,597,151	3,604,966	3,609,237
3,580,364	3,597,254	3,605,053	3,609,256
3,581,614	3,597,320	3,605,055	3,609,400
3,581,659	3,597,349	3,605,081	3,609,412
3,581,921	3,597,381	3,605,249	3,609,538
3,582,276	3,597,655	3,605,291	3,609,644
3,582,475	3,597,769	3,605,436	3,609,717
3,583,414	3,598,382	3,605,662	3,609,768
3,583,523	3,598,387	3,605,775	3,609,843
3,583,953	3,598,461	3,606,138	3,609,858
3,583,960	3,598,623	3,606,422	3,610,081
3,584,941	3,599,278	3,606,460	3,610,096
3,585,171	3,599,304	3,606,469	3,610,108
3,585,284	3,599,325	3,606,504	3,610,624
3,585,673	3,599,549	3,606,515	3,611,130
3,585,969	3,599,556	3,606,732	3,611,256
3,586,074	3,599,634	3,606,925	3,611,335
3,586,747	3,599,700	3,607,058	3,611,561
3,587,103	3,599,716	3,607,059	3,611,608
3,587,396	3,599,919	3,607,165	3,611,634
3,588,322	3,600,204	3,607,180	3,612,156
3,588,493	3,600,269	3,607,245	3,612,853
3,588,506	3,600,280	3,607,331	3,612,989
3,588,646	3,600,456	3,607,359	3,613,102
3,589,372	3,600,511	3,607,360	3,613,511
3,590,211	3,600,631	3,607,377	3,613,633
3,590,406	3,600,738	3,607,400	3,613,685
3,590,551	3,600,761	3,607,402	3,615,118
3,590,691	3,600,780	3,607,445	3,615,289
3,590,856	3,601,463	3,607,486	3,615,523
3,591,324	3,601,648	3,607,542	3,615,952
3,591,444	3,601,714	3,607,544	3,616,044
3,591,955	3,601,961	3,607,735	3,616,291
3,592,767	3,602,047	3,607,757	
3,592,779	3,602,174	3,607,766	

Dedications

3,120,482.—*Lynn A. Williams,* Winnetka, Ill. APPARATUS FOR ELECTROLYTIC HOLE SINKING. Patent dated Feb. 4, 1964. Dedication filed Dec. 23, 1971, by the assignee. *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,123,545.—*Lynn A. Williams,* Winnetka, Ill. ELECTRODE FOR ELECTROLYTIC SHAPING. Patent dated Mar. 3, 1964. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,130,140.—*Leonard Malkowski,* La Grange, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS. Patent dated Apr. 21, 1964. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,172,831.—*Lynn A. Williams,* Winnetka, Ill. GRINDING MACHINE. Patent dated Mar. 9, 1965. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,196,093.—*Lynn A. Williams,* Winnetka, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS AND METHOD FOR NON-PARALLEL WORKPIECE SURFACES. Patent dated July 20, 1965. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,214,360.—*Joseph L. Bender,* Wheeling, and *Lynn A. Williams,* Winnetka, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS. Patent dated Oct. 26, 1965. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971

3,218,248.—*Lynn A. Williams,* Winnetka, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS AND METHOD. Patent dated Nov. 16, 1965. Dedication filed Dec. 23, 1971, by the assignee *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,235,475.—*Lynn A. Williams,* Winnetka, Ill. ELECTROLYTIC SHAPING APPARATUS AND METHOD. Patent dated Feb. 15, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

Corrected Dedications

3,488,616.—*George I. Duncan* and *Robert D. Mees,* Fort Wayne, Ind. DRY TYPE TRANSFORMER WITH IMPROVED ENCAPSULATING COMPOSITION. Patent dated Jan. 6, 1970. Dedication filed Sept. 22, 1971, by the assignee, *General Electric Company.*

Hereby dedicates to the Public the above-identified patent.

3,513,523.—*Armin F. Mittermaier* and *Lowell M. Mason,* Fort Wayne, Ind. MACHINE AND METHOD FOR FORMING LAMINATIONS FOR MAGNETIC CORES. Patent dated May 26, 1970. Dedication filed Sept. 22, 1971, by the assignee, *General Electric Company.*

Hereby dedicates to the Public the above-identified patent.

Disclaimers

3,574,826.—*Thomas H. Shepherd* and *Francis E. Gould,* Princeton, N.J. HYDROPHILIC POLYMERS HAVING VITAMINS ABSORBED THEREIN. Patent dated Apr. 13, 1971. Disclaimer filed Aug. 11, 1970, by the assignee, *National Patent Development Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to Apr. 27, 1988.

3,581,487.—*William Charles Loomes* and *Arthur James Marrs,* Derby, and *Peter Heffernan,* Carlisle, Cumberland, England. YARN DRAWING MACHINE. Patent dated June 1, 1971. Disclaimer filed Dec. 28, 1971, by the assignee, *Courtaulds Limited.*

Hereby enters this disclaimer to claims 1 to 8, inclusive, of said patent.

3,615,836.—*John S. Batzold*, Westfield, N.J. FUEL CELL CONTAINING AND A PROCESS OF MAKING AN ACTIVATED FUEL CELL CATALYST. Patent dated Oct. 26, 1971. Disclaimer filed Aug. 12, 1970, by the assignee, *Esso Research and Engineering Company.*

Hereby disclaims the portion of the term of the patent subsequent to Mar. 4, 1986.

Patents Available for Licensing or Sale

3,572,294. COW CONTROLLER. Wallace L. Baker, R.F.D. #1, Box 166A, Burley, Idaho, 83318.

3,102,721. PANTAGRAPH EQUILIBRIUM SPRING MECHANISM. Correspondence to: Paul D. Levie, 2333 N. Central Ave., Phoenix, Ariz., 85004.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poinciana Drive, Martinez, Ga., 30907.

3,500,558. DEVICE FOR THE TEACHING OF NUMERATION SYSTEMS TO ALL BASES. Blair J. Matejczyk, Alliance College, Cambridge Springs, Pa., 16403.

3,537,220. MASONRY WALL BRACE. James P. Ellis, 1381 Blakely Road, East Aurora, N.Y., 14052.

3,591,242. TRACK FOR TRACKLAYING VEHICLES. Gerlach-Werke GmbH, Homburg, Germany. Correspondence to Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,602,600. WRITING IMPLEMENT. Merz & Krell, Auf der Beune 18, Germany. Correspondence to Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,612,070. POWER-DRIVEN HAND-HELD HAIR CURLER. Robert M. Reyes, 614 Forest Ave., Los Angeles, Calif., 90033.

3,625,439. VEHICULAR TRAILER HAVING FLUENT MATERIAL DISTRIBUTION MEANS. Hans Gisler. Correspondence to: Werner W. Kleeman, Suite 212, Crystal Plaza 1, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

3,625,467. MOVABLE SUPPORT DEVICE FOR AT LEAST ONE INSTRUMENT SERVING TO MEASURE THE DIMENSIONS OF AN OBJECT. Willy Schaerer. Correspondence to: Werner W. Kleeman, Suite 212, Crystal Plaza 1, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

3,635,134. VIBRATORY ROLLERS. H. E. THOMAS, Francis Lane, Chester, N.J., 07930.

3,648,294. ENDOPROSTHESIS, ESPECIALLY FOR HIP JOINTS. Dr. Esfandiar Shahrestani. Correspondence to: Meyer, Tilberry & Body, 20th Floor, Terminal Tower, Cleveland, Ohio, 44113.

The following 2 patents are offered by W. S. Routzahn, Glen Burnie, Md. Correspondence to: Sherman Levy, Suite 635, Washington Bldg., 15th and New York Ave. NW., Washington D.C., 20005.

3,609,893. ADVERTISING AND DISPLAY HOLDER.

3,624,601. VEHICLE SEATBELT WARNING AND IGNITION CONTROL SYSTEM.

General Electric Company is prepared to grant non-exclusive licenses under the following 23 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: General Electric Co., Laminated Products Dept., 1 Campbell Road, Schenectady, N.Y., 12306.

3,466,360. METHOD OF MAKING FREQUENCY-STABILIZED METAL-CLAD LAMINATES AND ARTICLE.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,621,109. ELECTRICAL INSULATOR AND METHOD OF MAKING.

3,625,737. PROTECTIVE COATING AND METHOD OF MAKING.

Applications for license under the following 10 patents may be addressed to: General Electric Company, Bldg. 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

3,365,616. OVERVOLTAGE PROTECTION SYSTEM FOR ELECTRICAL APPARATUS WITH CURRENT LIMITING FUSE AND REMOVABLE OIL FUSE IN SERIES ON LINE SIDE.

3,368,175. VOLTAGE LEAD ENTRANCE FOR ENCAPSULATED ELECTRICAL DEVICES.

3,366,762. ARC CONTROLLING ELECTRODES FOR SWITCHES AND GAPS.

3,414,698. HIGH VOLTAGE TRANSFORMER TYPE HEATER FOR HEATING FLUIDS.

3,417,216. ARC CONTROLLING ELECTRODES FOR SWITCHES AND GAPS.

3,466,593. TERMINATION.

3,471,816. LOADBREAK FUSEHOLDER.

3,562,478. RESISTANCE WELDING APPARATUS FOR PRODUCING SUBSTANTIALLY CREVICE-FREE WELDS.

3,573,553. POWER SUPPLY PROTECTOR WITH RESET MEANS.

3,600,998. TICKET PUNCHING MECHANISM AND STOP ASSEMBLY.

Applications for license under the following 10 patents may be addressed to: Patent Counsel LSTG-I & MT Divisions, General Electric Company, 1 River Road, Bldg. No. 43, Schenectady, N.Y., 12305.

3,515,011. LUBRICATION AND COOLING OF HIGH SPEED GEARS.

3,536,542. ALLOY HEAT TREATMENT.

3,548,592. COMBINATION FUEL NOZZLE AND SPARK PLUG FOR A GAS TURBINE.

3,549,356. HIGH TEMPERATURE CORROSIVE RESISTANT COBALT-BASE ALLOYS.

3,571,635. TURBINE-GENERATOR STATOR FRAMES.

3,574,507. AIR/FUEL MIXING AND FLAME STABILIZING DEVICE FOR FLUID FUEL BURNER.

3,607,663. FLUID PURIFICATION SYSTEM.

3,614,112. FLUID DEFLECTOR APPARATUS.

3,614,457. TURBINE OVERSPEED TRIP ANTICIPATOR.

3,614,493. UNIVERSAL LIQUID COOLED CONNECTION ASSEMBLY.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 27 patents.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

3,631,576. METHOD OF PRODUCING A COLOR KINESCOPE.

3,631,593. ASSEMBLY OF FILAMENTARY DISPLAY DEVICES.

3,632,436. CONTACT SYSTEM FOR SEMICONDUCTOR DEVICES.

3,632,864. SIGNAL SEEKING SYSTEM FOR RADIO RECEIVERS WITH TUNING INDICATING CIRCUITRY FOR CONTROLLING THE SIGNAL SEEKING.

3,632,869. PARTIALLY OVERLAPPING HOLOGRAM MOTION PICTURE RECORD.

3,634,612. IDENTIFIER CIRCUITS FOR COLOR BAR TYPE TEST GENERATORS.

3,634,620. NOISE PROTECTED AGC CIRCUIT WITH AMPLITUDE CONTROL OF FLYBACK PULSES.

3,634,869. INTERPULSE TIME INTERVAL DETECTION CIRCUIT.

3,634,876. SIGNAL DETECTING AND LATCHING CIRCUIT.

3,634,933. MAGNETIC HEAD METHOD.

3,365,510. HEAT SEAL OF A GLASS MEMBER TO ANOTHER MEMBER.

3,635,751. LITHIUM SILICATE GLARE-REDUCING COATING AND METHOD OF FABRICATION ON A GLASS SURFACE.

3,636,418. EPITAXIAL SEMICONDUCTOR DEVICE HAVING ADHERENT BONDING PADS.

3,636,461. TRANSFERRED ELECTRON AMPLIFIER WITH OSCILLATION STABILIZATION CIRCUIT.

3,636,475. OSCILLATOR WITH VARIABLE REACTIVE CURRENT FREQUENCY CONTROL.

3,636,527. STORAGE CIRCUIT.

3,636,836. PHOTOGRAPHIC PROCESS FOR PREPARING A SCREEN STRUCTURE FOR A CATHODE-RAY TUBE.

3,637,211. BOWLING SPLIT DETECTOR.

3,637,308. COLOR CORRECTION OF PRISMATIC OFF-AXIS OPTICAL SYSTEM.

3,637,917. HERMETIC HIGH-CURRENT TERMINAL FOR ELECTRONIC DEVICES.

3,637,925. SYSTEM AND FILTER FOR ENCODING COLOR IMAGES ONTO BLACK AND WHITE FILM.

3,637,935. KEYED SUBSTRATE FIELD EFFECT TRANSISTOR FREQUENCY-SELECTIVE CIRCUITS.

3,638,039. OPERATION OF FIELD-EFFECT TRANSISTOR CIRCUITS HAVING SUBSTANTIAL DISTRIBUTED CAPACITANCE.

3,638,067. TRIGGERING CIRCUIT FOR CRT DEFLECTION SYSTEM UTILIZING AN SCR.

3,638,129. CHOPPER STABILIZED AMPLIFIER.

3,638,141. COMPACT, HIGH-POWER, HIGH-EFFICIENCY SILICON AVALANCHE DIODE L-BAND OSCILLATOR.

3,638,214. VECTOR GENERATOR.

Patents Withdrawn from Register

Robert B. Rand hereby withdraws the following patent from the Register of Patents Available for Licensing or Sale. The patent was listed as being available, in the OFFICIAL GAZETTE as indicated below:

3,557,580. SELF-CLEANABLE HAIRBRUSH. Dec. 7, 1971.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 22, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-08-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-04-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-02-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-14-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	6-23-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	9-11-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-05-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-04-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-04-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-04-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-06-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-04-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	2-22-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-15-71

Expiration of patents: The patents within the range of numbers indicated below expire during March 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,702,901 to 2,705,321, inclusive
Plant Patents..... Numbers 1,355 to 1,373, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 21, 1972

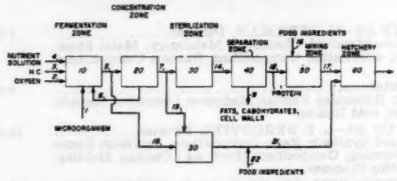
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T896,037
FISH, OYSTER AND CRUSTACEAN FOOD COMPRISING PARTICULAR PROTEINS DERIVED FROM HYDROCARBONS

Donald L. Wright, 35 E. 75th St., New York, N.Y. 10021

Filed May 1, 1970, Ser. No. 33,817
Int. Cl. A23k *1/00*
U.S. Cl. 99—3
1 Sheet Drawing. 19 Pages Specification



A unique, high quality protein food composition which is particularly adapted as food for fish, oysters and crustaceans, is prepared in a fermentation process in which a microorganism, such as bacterium, is grown on a mixture of petroleum hydrocarbons. The preparation is conducted in an inorganic salt and water under aerobic conditions. After fermentation, the microorganism cells are harvested, sterilized, and fed as an aqueous solution to fish, crustaceans and the like. Optionally, the protein content of the sterilized, harvested microorganisms can be separated from the cell walls and other non-protein products by extracting the sterilized, aqueous solution at a pH ranging from about 8 to 12. Protein subsequently can be precipitated by acidifying the extract to a pH in the range of from about 5.2 to 3.2. The precipitated protein can then thereafter be fed to fish and the like.

T896,038
EXTERNAL SLITTING AFTER TUBULAR FILM PREPARATION

Donald F. Griffin, Clinton, Iowa, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

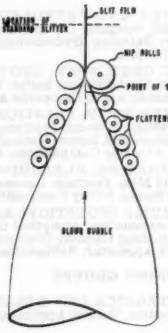
Continuation of abandoned application Ser. No. 796,530, Feb. 4, 1969. This application Dec. 23, 1970, Ser. No. 101,125
Int. Cl. B29c *17/07, 17/14, 17/16*
U.S. Cl. 264—95
1 Sheet Drawing. 7 Pages Specification

In a process for preparing a thermoplastic film such as polyethylene or polypropylene by

(a) extruding the molten thermoplastic material into a tubular film;
(b) expanding the tubular film by the application of internal pressure, forming a bubble having a hoop stress, mathematically expressed as:

$$S=Pd\div 2t$$

where
S=bubble hoop stress,
P=internal pressure of the bubble,
d=the diameter of the bubble,
t=film thickness;
(c) flattening the tube by external pressure such as a series of rolls on opposite sides of the tube in a converging configuration;
(d) collapsing the tube by passing it through at least one set of nip rolls; and
(e) slitting the edges of the collapsed tube,



the improvement which comprises externally slitting the flattened tube along at least one lateral edge before passing the tube through the nip rolls and at a point where the bubble hoop stress is positive and less than about 10%, preferably less than 5%, of its maximum value, at full expansion, to minimize the amount of wrinkling at the slitting edge of the collapsed bubble thereby minimizing edge losses.

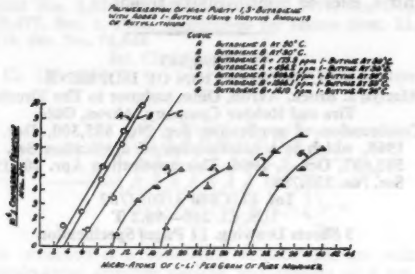
T896,039
PLASTISOLS OF POLYVINYL CHLORIDE AND ITS COPOLYMERS

David L. Valentine, 4508 Chickasaw Road 37664; Don R. Leonard, 1425 Warpath Drive 37664; and Albert D. Beeler, 3320 Grandview 37660, all of Kingsport, Tenn.

Continuation-in-part of application Ser. No. 868,679, Oct. 23, 1969. This application Dec. 28, 1970, Ser. No. 102,243
Int. Cl. C08f *19/14*; C08h *9/00*
U.S. Cl. 260—23
No Drawing. 22 Pages Specification

A plasticizer blend for plastisols of polyvinyl chloride, or copolymers of polyvinyl chloride, particularly useful in carpet backings. The blend comprises 2,2,4-trimethylpentane-1,3-diol diisobutyrate, a dialkyl phthalate in which each of the alkyl moieties contain from 6 to 10 carbon atoms, and either (a) 2,2,4-trimethylpentane-1,3-diol monoisobutyrate monobenzoate or (b) a dialkyl phthalate in which each of the alkyl moieties contain from 4 to 6 carbon atoms.

T896,040
PROCESS OF POLYMERIZING BUTADIENE IN THE PRESENCE OF LITHIUM CATALYST
Marlyn J. Brock, Akron, Ohio, assignor to The Firestone Tire and Rubber Company, Akron, Ohio
Continuation of applications Ser. No. 4,444, Jan. 19, 1970, and Ser. No. 58,386, Oct. 3, 1966, which is a continuation-in-part of application Ser. No. 427,415, Jan. 22, 1965. This application Jan. 14, 1971, Ser. No. 106,556
Int. Cl. C08d *3/06, 3/08*
U.S. Cl. 260—94.2
1 Sheet Drawing. 8 Pages Specification



1,3-butadiene is polymerized in the presence of a hydrocarbon lithium catalyst in the presence of 400 to 1500 parts, more or less, of an alpha-acetylene or a lithium acetylide containing 2 to 8 carbon atoms (calculated as ethyl acetylene) per million parts of monomer as a modifier. The amount of catalyst present is in substantial excess over the stoichiometric amount required to react with the alpha-acetylene to produce lithium acetylide. Such excess is sufficient to initiate polymerization and produce polymer of the desired molecular weight.

T896,041
AUTOMATIC DISCONNECT MEANS FOR A LIGHTNING ARRESTER
Arthur A. Olsen, Pittsfield, Mass., assignor to General Electric Company
Filed Feb. 22, 1971, Ser. No. 117,231
Int. Cl. H01h *31/00*
U.S. Cl. 200—48
1 Sheet Drawing. 12 Pages Specification

An automatic disconnect means is provided for mechanically separating, or opening, a circuit connecting a station-type lightning arrester to an overhead bus bar arrangement. The automatic disconnect means is characterized by being responsive to a failure of the arrester that causes the arrester housing to fall away from the overhead bus to which it is connected. The disconnect means operates to prevent mechanical loading of the bus due to the weight of all, or a portion, of the arrester housing remaining connected to it after such a failure.

T896,042
DURABLE PRESS CATALYST SYSTEM
Richard N. Knowles, P.O. Box 302, R.D. 1, Millcreek Road, Hockessin, Del. 19707
Filed Mar. 1, 1971, Ser. No. 119,818
Int. Cl. D06m *9/00*
U.S. Cl. 8—115.7
No Drawing. 14 Pages Specification

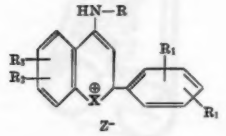
An improved catalyst system for reacting durable press resins with fabrics containing both cellulosic and non-cellulosic fibers consisting of zinc hydroxyacetate or a mixture of hydroxyacetic acid with magnesium chloride, zinc chloride or zinc nitrate, adjusted to a pH of 4.5 to 6.0. This catalyst system used in the conventional pad-dry-cure process imparts adequate durable press qualities with less impairment of the tensile strength and abrasion resistance of the fabric than conventional catalyst systems.

T896,043
STABILIZATION OF PHOTOGRAPHIC MULTILAYER COLOR PRODUCTS
Harry C. Baden, Webster, N.Y. (1669 Lake Ave., Rochester, N.Y. 14615), and Charleton C. Bard and James S. Bruce, both of 1669 Lake Ave., Rochester, N.Y.
Filed Mar. 1, 1971, Ser. No. 120,057
Int. Cl. G03c *1/76*
U.S. Cl. 96—68
No Drawing. 17 Pages Specification

Multilayer color films of the incorporated coupler type are stabilized so as to maintain their sensitometric properties during storage by hardening the emulsion layers with an aldehydic gelatin hardener such as succinaldehyde bis-bisulfite, neutralizing unreacted hardener with, for example, hydroxylamine sulfate, treating the emulsion layers with bromide salt solution and drying the film.

T896,044
SOLID SCINTILLATORS
Lorenzo Federico Costa, Frank Grum, and James Albert Van Allan, all % Eastman Kodak Co., Kodak Park Division, Rochester, N.Y. 14650
Filed Mar. 4, 1971, Ser. No. 121,135
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R
No Drawing. 15 Pages Specification

This invention relates to solid scintillators which are 2-aryl-4-sec-amino-benzo[b]pyrylium salts or 2-aryl-4-sec-aminobenzo[b]thiapyrylium salts. The solid scintillators which may be employed according to the invention can be represented by the structural formula:



wherein X is a sulfur or oxygen atom; Z is an anionic function as exemplified by perchlorate, halides, fluoroborate, sulfonate and the like; R is an alkyl or aryl group; each of R_1 can be a hydrogen atom, an alkyl group or an alkoxy group; and R_2 and R_3 each can be a hydrogen

atom or when taken together are attached to adjacent carbon atoms and represent the atoms necessary to form a fused cyclic aromatic moiety such as benzo or naphtho and substituted fused aromatic rings. The preferred compounds are 4-butylamino-2-(4-methoxyphenyl)benzo[b] pyrylium perchlorate, 4-butylamino-2-(4-methoxyphenyl) benzo[b]pyrylium fluoroborate and (4-benzylamino)-2-phenylbenzo[b]pyrylium perchlorate.

The solid scintillators are advantageously employed in the continuous monitoring of beta-radiation in effluents, particularly in conjunction with liquid column chromatography.

T896,045
DETERGENT BAR
William L. Groves, Jr., 715 N. 7th St., Ponca City, Okla. 74601
Continuation of abandoned application Ser. No. 773,296, Nov. 4, 1968. This application Mar. 15, 1971, Ser. No. 124,432
Int. Cl. C11d *1/14, 9/46*
U.S. Cl. 252—121
No Drawing. 21 Pages Specification

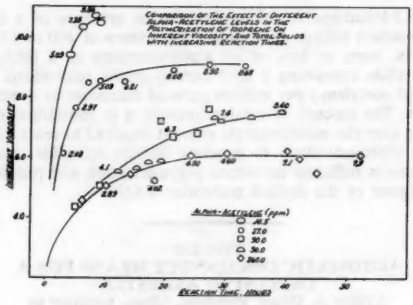
A detergent bar exhibiting excellent curd dispersing characteristics, good lathering properties, and a low wear rate can be prepared from a mixture of about 55–83% of an alkali metal soap having about 15–30% of a C_{12} to C_{18} alpha olefin sulfonate dispersed throughout, and from about 2–15% moisture. The soap may be derived from tallow coconut oil mixtures or the bar may be free of coconut oil soaps. About 25–40 percent of the alkali metal soap may be replaced with a magnesium soap to improve the hardness of the bar. The additional inclusion of up to 10% of an alkyl aryl sulfonate, such as an alkyl benzene sulfonate with a C_5 to C_{18} linear alkyl moiety, further enhances the lime soap dispersion characteristics of the bar.

T896,046
PAPER MATERIALS IMPREGNATED WITH POLYSILOXANES
Robert J. Vetter, 7 Maple Ave., Richmond, Va. 23226
Filed Apr. 15, 1971, Ser. No. 134,449
Int. Cl. B32b *27/34*
U.S. Cl. 117—138.8 N
No Drawing. 15 Pages Specification

A flexible, coherent sheet material made of fibrids of a non-fusing aromatic polyamide and, optionally, fibers of a non-fusing aromatic polyamide and/or particulate mica, which sheet material is impregnated with a liquid polysiloxane. The sheet materials, which are paper-like, are useful for electrical insulation purposes, especially where high temperatures are encountered. The material contains 10 to 100 parts by weight of the fibrids, 0 to 50 parts by weight of the fibers, 0 to 90 parts of the mica and 1 to 70% of the polysiloxane. The polysiloxane has the formula

where R is hydrocarbon, R′ is hydrogen or hydrocarbon, *n* is at least 10, and the molecule is endcapped with hydroxyl, ester or trimethylsiloxy groups.

T896,047
POLYMERIZATION OF ISOPRENE
Marlyn J. Brock, Akron, Ohio, assignor to The Firestone Tire and Rubber Company, Akron, Ohio
Continuation of application Ser. No. 885,300, Dec. 15, 1969, which is a continuation of application Ser. No. 583,607, Oct. 3, 1966. This application Apr. 20, 1971, Ser. No. 135,788
Int. Cl. C08d *3/00, 3/02*
U.S. Cl. 260—94.2 T
3 Sheets Drawing. 11 Pages Specification



Isoprene is polymerized by a hydrocarbon lithium catalyst in the presence of 15 to 300 parts per million of alpha-acetylene or lithium acetylide or an allene of 3 to 8 carbon atoms as a modifier, the amount of catalyst being in substantial excess of the stoichiometric amount required to react with the modifier, such excess being sufficient to initiate polymerization.

REISSUES

MARCH 21, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

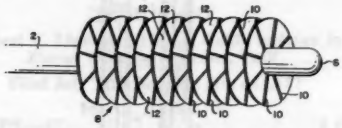
27,310
CEREBRO-VENTRICULAR CATHETER

Salomon Hakim, 13 Carrera, 48–26 Bogota, Colombia

Original No. 3,516,410, dated June 23, 1970, Ser. No. 695,477, Jan. 3, 1968. Application for reissue Sept. 23, 1970, Ser. No. 74,544

Int. Cl. A61m *27/00*

U.S. Cl. 128—350 R 10 Claims



The invention is a ventricular catheter for use with ventriculo-atrial shunting devices, and consists of a tubing of soft, tissue-compatible material with intake apertures positioned in the wall of the tubing at one end thereof, the end of the tubing preferably being closed.

Thin membranes of flexible, tissue-compatible material are attached between the holes and extend outward from the wall of the tube. The flexibility is such that the lightest contact with attached tissue will bend the membrane and protect the underlying hole. The membrane may be radially slit to facilitate collapsing upon passing of the catheter through tissue. The membranes are long enough, so that when the catheter is inserted in tissue, they cover the apertures to prevent scraping of tissue thereby.

27,311
4-[p-(SUBSTITUTED AMINO)PHENYL] MORPHOLINES

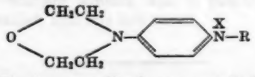
John J. D'Amico, Akron, and Sidney T. Webster, Worthington, Ohio, assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Original No. 3,392,170, dated July 9, 1968, Ser. No. 483,294, Aug. 27, 1965. Application for reissue Aug. 27, 1970, Ser. No. 67,638

Int. Cl. C07d *87/40*

U.S. Cl. 260—247.5 R 2 Claims

Antiozonants of the formula



where X is [hydrogen or] nitroso and R is alkyl of 3 to 12 carbon atoms or cycloalkyl of 5 to 12 carbon atoms are new compounds useful for protecting natural and synthetic rubbers from ozone degradation.

27,312
CONTROL SYSTEM FOR ELECTROLYTIC MACHINING APPARATUS

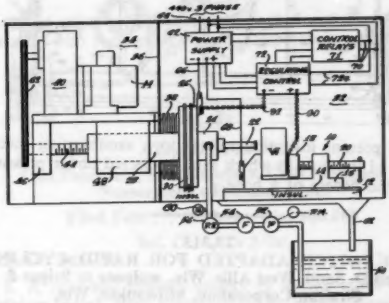
Merlin O. Petroff, Grayslake, Ill., assignor to Anocut Engineering Company, Elk Grove Village, Ill.

Original No. 3,433,728, dated Mar. 18, 1969, Ser. No. 385,746, July 28, 1964. Application for reissue Sept. 4, 1969, Ser. No. 871,489

Int. Cl. B23p *1/04*; B01k *1/00*

U.S. Cl. 204—224 12 Claims

An electrolytic machining apparatus of the type having an electrode placed opposite an electrode with a power unit to advance the electrode and workpiece toward each other while electrolyte is pumped through the gap between the electrode and the workpiece, an electric circuit for the power unit and the electrolyte pump, a transformer, a current rectifying output stage for electrolyzing current including at least one silicon controlled rectifier connected between the transformer and the electrode and



workpiece, a voltage control unit coupled to the rectifier to maintain the electrolyzing current voltage at a predetermined value, and a control unit connected to detect an instantaneous charge in the electrolyzing current voltage to interrupt the firing of the silicon controlled rectifier and to cause the electric circuit to deenergize the power unit and the electrolyte pump.

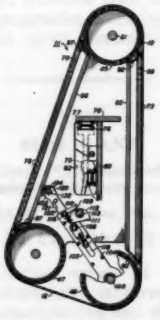
27,313
BELT TRACKING SYSTEM

Hugh L. Jones, Rochester, and David R. Stokes, Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Original No. 3,500,694, dated Mar. 17, 1970, Ser. No. 826,740, Mar. 27, 1969, which is a continuation of Ser. No. 731,755, May 24, 1968. Application for reissue Aug. 3, 1970, Ser. No. 60,396

Int. Cl. F16h *7/18*

U.S. Cl. 74—241 7 Claims



A belt tracking arrangement for use with a belt supporting roller wherein the shaft for the roller is mounted for short pivotal movement about an axis normal to its axis and which lies in a plane that bisects the angle of the belt runs on either side of the roller.

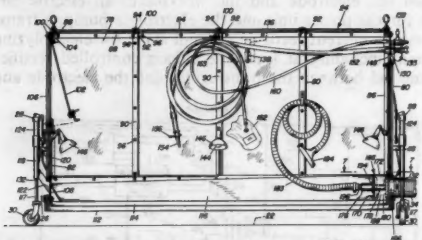
27,314
SANDBLASTER FOR FLOORS

Anthony E. Codina and George C. Punton, San Diego County, Calif., assignors to Marine & Industrial Coatings Co., San Diego, Calif.

Original No. 3,407,538, dated Oct. 29, 1968, Ser. No. 575,616, Aug. 29, 1966. Application for reissue Nov. 26, 1969, Ser. No. 888,175

Int. Cl. B24c *3/06*

U.S. Cl. 51—8 **4 Claims**



The present invention relates to a sandblasting mechanism of the type in which sand is ejected under pressure from the nozzle of a hose.

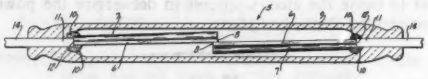
27,315
REED SWITCH ADAPTED FOR RAPID CYCLING

John D. Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.

Original No. 3,315,193, dated Apr. 18, 1967, Ser. No. 482,699, Aug. 26, 1965. Application for reissue July 31, 1970, Ser. No. 60,055

Int. Cl. H01h *51/28*

U.S. Cl. 335—154 **6 Claims**



A reed switch wherein each reed is provided with a relatively thicker post extending along the reed at the side remote from the other reed and the post is secured to the fixed end of its reed only.

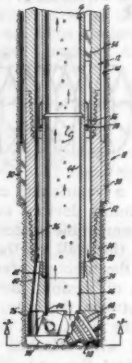
27,316
DRILL BIT

Wayland D. Elenburg, Monahans, Tex., assignor to Small Business Administration

Original No. 3,416,617, dated Dec. 17, 1968, Ser. No. 574,054, Aug. 22, 1966. Application for reissue Dec. 16, 1969, Ser. No. 888,176

Int. Cl. E21b *9/08;* **E21c** *13/00*

U.S. Cl. 175—339 **12 Claims**



A drill bit adapted for use with a continuous dual passage drill pipe and including fluid ducts for directing flow from around the inner drill pipe onto the cutting members. A skirt around the cutting members greatly restricts flow to the outside of the bit so that almost all return flow is up through the inner pipe. A radial collar further restricts upward flow.

Delayed Printing of Plant Patents

Plant Patents, dated to issue on October 5, October 12, and October 19, 1971, were omitted from publication in the OFFICIAL GAZETTE on the above dates due to the unavailability of full color reproductions. Normal publication of Plant Patents will resume with the Issue of March 28, 1972.

PLANT PATENTS

GRANTED OCTOBER 5, 1971

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,063

ROSE PLANT

Robert V. Lindquist, Hemet, Calif., assignor to Hemet Wholesale, Hemet, Calif.

Filed July 11, 1969, Ser. No. 841,157

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—17 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous and upright habit of growth, a unique, star-shaped flower form, better than average flower petal substance, and a distinctive and attractive bright coral orange flower color.

3,064

NECTARINE

Grant Merrill, 416 N. Anderson Road, Exeter, Calif. 93221

Filed Oct. 31, 1969, Ser. No. 873,142

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine substantially as illustrated and described, which is characterized by a heavily productive and regular bearing tree producing very easily ripening fruit with red waxy skin which is large for its season; and which most nearly resembles Sunbright nectarine, U.S. Plant Patent 2,138, but is distinguished therefrom in bearing more heavily and regularly, in blooming earlier making it better adapted to areas of warmer winters, and in bearing fruit which is redder, waxier, and has less russet.

3,065

ROSE PLANTS

J. Benjamin Williams, 2800 Elnora St., Silver Spring, Md. 20902

Filed Nov. 5, 1969, Ser. No. 874,422

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the Orange Red coloration of the open blooms, changing to soft Coral overlay, the abundant Dark Green Redcast glossy foliage, the strong, stocky habit of growth and the large flower spray and well formed blooms which exhibit a wide range of color variation in Orange Red and Coral tones, varying with the age of bloom, temperature and soil.

3,066

AZALEA PLANT

Carl Pearlstein, San Francisco, Calif., assignor to Nurserymen's Exchange, Inc.

Filed Feb. 17, 1969, Ser. No. 800,009

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—57 1 Claim

1. A new and distinct variety of azalea plant of the Belgian Indica class substantially as herein shown and described primarily characterized by its general similarity to "Improved Red Wing" of which it is a sport and by its China Rose color (HCC 024/1), its greater tendency to produce double bloom and its tendency to have fasciated, multiple styles.

3,067

APRICOT TREE

Willard Clayton Hill, Visalia, Calif., assignor to L. E. Cooke Co., Visalia, Calif.

Filed Sept. 18, 1969, Ser. No. 859,216

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—39 1 Claim

A large, vigorous, upright, dense, vase-formed apricot tree which is self-fertile and a regular and very productive bearer of large, freestone fruit; the tree having unusually long and progressive blooming and ripening periods, and the fruit being substantially resistant to pit burn.

3,068

ROSE PLANT

Samuel McGredy, % S. McGredy Son, Ltd., Portadown, Northern Ireland

Filed Sept. 9, 1968, Ser. No. 758,634

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—25 1 Claim

1. A new and distinct variety of rose plant of the floribunda class substantially as herein shown and described primarily characterized by: the extremely well formed, bright orange, small hybrid tea type blooms; the quick repeat-flowering habit; the medium size plant of somewhat spreading habit, profusely covered in medium green foliage.

PLANT PATENTS

GRANTED OCTOBER 12, 1971

3,069
ROSE PLANT
Robert V. Lindquist, Hemet, Calif., assignor to Hemet Wholesale, Hemet, Calif.
Filed July 24, 1969, Ser. No. 844,674
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—29 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a low-growing and vigorous plant habit, excellent foliage, a free flowering habit, dainty "Garnette"-like buds which open to small, flat, perfectly formed, attractive full flowers of over 100 petals per flower on the average, a distinctive and attractive velvety red flower color, good flower color retention even under adverse weather conditions, and an above average lasting quality of the flowers both on the bush and as cut flowers.

3,070
ROSE PLANT
Samuel McGredy, S. McGredy & Son Ltd., Portadown, Ireland
Filed Nov. 17, 1969, Ser. No. 877,535
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class substantially as herein shown and described primarily characterized by: the extremely free flowering compact healthy plant; the semi-double bright orange scarlet blooms carried in small trusses close to the foliage.

3,071
ROSE PLANT
Samuel McGredy, S. McGredy & Son Ltd., Portadown, Ireland
Filed Nov. 17, 1969, Ser. No. 877,534
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class substantially as herein shown and described primarily characterized by: the tall upright plant allied to the freely produced dark Crimson new shoots; the scarlet and gold bicolor of the blooms turning Crimson with age; the heavily veined deep red foliage turning dark green when mature.

3,072
ROSE PLANT
Charles B. McCannon, Mount Clemens, Mich., assignor to Frank J. Munt Flowers, Inc., Mount Clemens, Mich.
Filed July 3, 1968, Ser. No. 742,469
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—18 **1 Claim**

A new variety of rose plant having very large deep pink blooms borne singly on sturdy thick stems and particularly characterized by a new and different color, a pleasant tea fragrance, numerous large petals, and excellent lasting quality both on the plant and as cut flowers; the new plant being a greenhouse rose of vigorous upright growth which blooms profusely in any season.

3,073
VARIETY OF ROSE
John W. Patterson, 6518 Kernel, Houston, Tex. 77017
Filed Aug. 22, 1969, Ser. No. 852,516
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of vigorous growing and good flower producing habits, profuse leathery green foliage, relatively large flowers which are borne on strong stems of long length, good flower form, good flower fragrance, average disease resistance, a distinctive and attractive general color tonality of the flowers corresponding to Currant Red, Plate 821/1, in the newly open flowers, and to near Currant Red, Plate 821/3, in the three-days open flowers, and good keeping qualities of the flowers as cut flowers.

3,074
VARIETY OF ROSE
John W. Patterson, 6518 Kernel, Houston, Tex. 77071
Filed Aug. 4, 1969, Ser. No. 847,474
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant of the grandiflora class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of good growing and flower producing habits, profuse glossy green foilage, relatively large flowers which are borne on strong, medium length stems, good flower form, good moderate fragrance, better than average disease resistance, attractive general color tonality of the flowers corresponding Cardinal in the newly open flowers, and to near Tyrian Purple, in the three-days open flowers, and good keeping qualities of flowers as cut flowers.

GRANTED OCTOBER 19, 1971

3,075
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Jan. 6, 1970, Ser. No. 1,065
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 **1 Claim**

A bush rose plant of the hybrid tea class which is tall growing and adapted for outdoor cultivation. The flowers are of average size for their class, with double petalage regularly arranged. The flowers are usually borne singly, but may appear in clusters of three or four on medium length stems of normal strength. The overall color effect is a strong reddish orange at first, tending towards a vivid red to strong red after a few days. The fragrance is subdued. The plant blooms abundantly outdoors, and blooms nearly continuously during the growing season. It is of upright-spreading habit, much branched.

3,076
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Jan. 6, 1970, Ser. No. 1,066
Int. Cl. A01h 5/00
U.S. Cl. Plt.—2 1 Claim

A climbing rose plant of the hybrid tea class, which is tall growing and has semi-glossy leaves of leathery texture, comprising three to seven leaflets of medium to large size; the flowers of said plant having a subdued fragrance and being of quite large size. The double petals are arranged regularly when fully open. The flowers are borne usually singly, but sometimes three or four, or even more, appear in irregular clusters on strong medium to long stems. The plant is free blooming outdoors, and blooms nearly continuously during the growing season. Its habit of growth is notably vigorous, tall, upright and branching.

3,077
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Jan. 6, 1970, Ser. No. 1,067
Int. Cl. A01h 5/00
U.S. Cl. Plt.—18 1 Claim

A bush rose plant of the hybrid tea class which is tall growing and adapted for outdoor cultivation. It is a free-growing, upright-spreading bush, much branched, producing large blooms of double petalage, which are generally purplish pink in overall color effect. The blooms are borne in abundance, almost continuously during the growing season, on straight, sturdy stems.

3,078
ROSE PLANT
Reimer Kordes, Holstein, Germany, assignor to Jackson & Perkins Company, Newark, N.Y.
Filed Aug. 22, 1969, Ser. No. 852,517
Int. Cl. A01h 5/00
U.S. Cl. Plt.—19 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous and heavily branched plant habit, with the branches originating mostly near the base of the plant, unusually large flowers, a distinctive and attractive flower color ranging between Rose Doree and Scarlet, said color being uniform in the half-open blooms but lightening to Geranium Pink after several days, and a moderately strong and fruity flower fragrance.

3,079
GLADIOLUS PLANT
Carl H. Fischer, St. Charles, Minn. assignor to Selected Glads, Inc., Albany, Ind.
Filed Aug. 6, 1969, Ser. No. 848,122
Int. Cl. A01h 5/00
U.S. Cl. Plt.—85 1 Claim

1. The new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized by its rugged plant, consistent performance, novel blend of blossom colors, and ability to open many florets at once.

3,080
ROSE PLANT
William A. Warriner, Newark, N.Y. assignor to Jackson & Perkins Company, Newark, N.Y.
Filed Aug. 6, 1969, Ser. No. 848,124
Int. Cl. A01h 5/00
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous and well-branched habit of growth, attractive green foliage, with the new foliage being darker in color than in the parent variety, "King's Ransom," and being Victoria Lake in color, a free blooming habit throughout the season, and an ovid bud form, said buds being basically yellow in color but heavily overlaid with Garnet Brown as the sepals unfold, and opening to high-centered flowers of pale Lemon Yellow color in the half-open stage, and said flowers maintaining a distinctive and attractive pale yellow color as they fully open.

3,081
PHILODENDRON PLANT
Robert H. McColley, Orlando, Fla., assignor to Yoder Bros., Inc., Barberton, Ohio
Filed Mar. 10, 1969, Ser. No. 805,910
Int. Cl. A01h 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of philodendron plant substantially as herein disclosed, characterized as to novelty by its robust, compact, upright habit, the firm texture of its leaves, the strong petioles with prominent lenticels, long lastingness in the greenhouse and under home conditions, together with its outstanding resistance to "shotgun fungus."

PATENTS

GRANTED MARCH 21, 1972

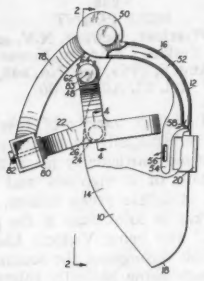
GENERAL AND MECHANICAL

3,649,964

VENTILATED WELDERS FACE MASK

Willy A. E. Schoelz, Portland, Oreg., and John W. Tidland, Vancouver, Wash., assignors to said Schoelz, by said Tidland

Filed June 4, 1970, Ser. No. 43,476
Int. Cl. A61f *9/06*
U.S. Cl. 2—8 **7 Claims**



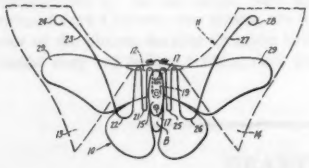
Ventilating means for a welder's face mask employing a battery-operated blower secured on the mask. Air passageways are provided in the mask which lead from the blower to inlet openings interiorly of the mask for ventilating the area between the mask and the welder's face. Batteries for operating the blower are mounted on the head band, and in structures utilizing a mask which can be tipped up on the headband, switch means are employed between the face mask and the headband which activate the blower in the down position of the mask and deactivate the blower in the up position of the mask.

3,649,965

NECKTIE

Alfred Krivda, P.O. Box 1055, Oroville, Calif.

Filed Aug. 11, 1970, Ser. No. 62,918
Int. Cl. A41d *25/08*
U.S. Cl. 2—154 **3 Claims**



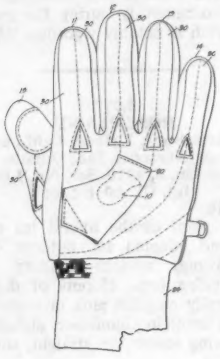
The present invention is directed to a necktie which consists of a body portion detachably secured to the collar of a shirt by a flexible spring wire member which engages over the neckband of the shirt and under the collar tabs of the shirt. The body member is provided with detachable fasteners and second body carrying wings detachably secured to the body member completely covering the body member and supporting wires.

3,649,966

HAND COVERING

Michael Peter Shields, Hollywood, Calif., assignor to Walk-On-Corp., Hollywood, Calif.

Filed Apr. 1, 1970, Ser. No. 24,534
Int. Cl. A41d *19/00*
U.S. Cl. 2—159 **5 Claims**



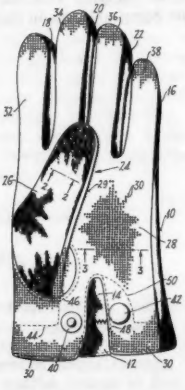
A hand covering having a closeable flap which when opened forms a funnel for the induction of warm air from the mouth and lungs of the wearer into the interior of the hand cover. This funnel is so formed to direct the warm breath toward and around the fingers of the wearer thereby warming them.

3,649,967

NON-SLIP GOLF GLOVE

Sandy K. Millman, 7 Adriance Avenue, Poughkeepsie, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,672
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 A **5 Claims**



Non-slip golf gloves adapted to be worn by golfers especially when handling clubs for driving, putting, etc. The

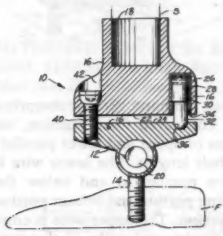
gloves are constructed of light fabric and the front portions are coated with minuscule, non-slip protuberances regularly arranged in rows and columns, being constituted of a rubber-like substance. The coated portions of the gloves are still pervious and still constitute a breathable fabric, whereby the entire glove is breathable, minimizing the likelihood of causing perspiration of the hand, and also having the ability to absorb and evaporate the natural perspiration. The non-slip surfaces are on those areas needed to reduce slippage when handling clubs, while at the same time the entire glove is fully breathable and perspiration absorbent whereby it is comfortable to wear. In addition, it tends to prevent blisters from forming.

3,649,968

ANGULAR ADJUSTMENT CONNECTOR FOR PROSTHETIC LIMB PARTS

Jan Prahl, Golenhof, Germany, assignor to Wilhelm Julius Teufel, Stuttgart, Germany

Filed Sept. 4, 1970, Ser. No. 69,841
Claims priority, application Germany, Sept. 12, 1970, P 19 46 257.8
Int. Cl. A61f *1/08*
U.S. Cl. 3—21 **14 Claims**



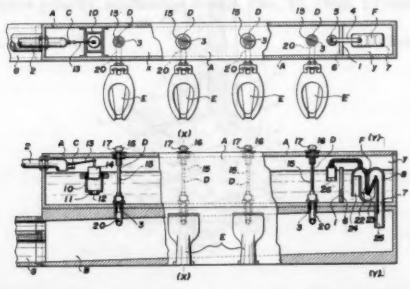
A connector for joining sections of a prosthesis comprising body and base members. The body is provided with a plurality of hydraulic support bearings and means fastening the base to it. The fastening means are adjustable to provide a selected angular relationship between the members. This relationship is maintained by the reaction of the bearing support to the fastening means.

3,649,969

FLUSHING TOILET APPARATUS

Shoken Ueda, Kanagawa-ken, Japan, assignor to The Toyotoki Co., Limited, Fukuoka-ken, Japan

Filed Apr. 2, 1970, Ser. No. 25,085
Claims priority, application Japan, May 10, 1969, 44/35985
Int. Cl. E03d *1/22, 3/00*
U.S. Cl. 4—11 **3 Claims**



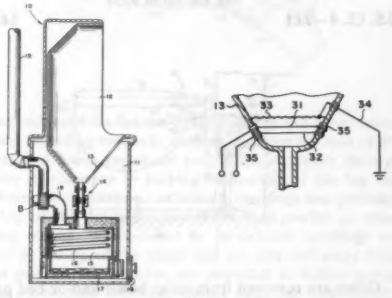
A battery of flush toilets, in which each is provided with separately operable means for admitting thereinto a limited flow of water from the washing chamber of a horizontally disposed water tank. Each toilet has a discharge pipe opening into a generally horizontal drain passage beneath said tank. A drain chamber at one end of the tank communicates through a restricted passage with the wash chamber to receive water from the latter and is provided with normally inactive siphon means operable when active to discharge water from the drainage chamber by gravity into the drain passage, there being means operative in response to repeated fluctuations in the water level of the wash tank for activating the siphon means to discharge its contents into the drain passage to flush out the latter.

3,649,970

AUTOMATIC INCINERATING URINAL

Ernest Bayne Blankenship, P.O. Box 35164, Irving, Tex.

Filed May 20, 1970, Ser. No. 38,998
Int. Cl. A47k *1/02*
U.S. Cl. 4—131 **2 Claims**



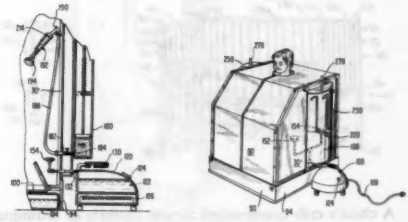
A waterless urinal comprised of a bowl having a drain which opens into an insulated electric incinerator having a pan in the bottom thereof and switch means actuated by use of the urinal for activating the heater of the urinal for a period of time.

3,649,971

PORTABLE STEAM BATH AND BATHING APPARATUS

Napoleon A. Basa, 46 Cordillera Street, Quezon City, Philippines

Filed May 15, 1970, Ser. No. 37,685
Int. Cl. A61h *33/06*
U.S. Cl. 4—164 **9 Claims**



A portable steam bath and bathing apparatus comprises an enclosure including a collapsable framework and a separate foldable, flexible cover attached thereto as well as base means. Vapor distribution means is supported by the framework for distributing vapor within the enclosure. Bath water dispenser means is supported by the framework and in-

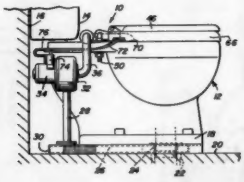
cludes a water discharge means disposed within the enclosure and a bath water container portion supported outside of the enclosure and including a spring urged plunger means to force water from the container portion through said water discharge means.

A dispenser device includes a hollow container portion for flowable material and has an outlet means. Plunger means is slidably mounted within the container portion and spring means normally urges the plunger means toward the outlet means. A cock arm is connected to the plunger means and extends through slot means formed in a housing means. The slot means has a part extending longitudinally of the housing and a part extending laterally of the housing. A manually operated control means is provided for controlling movement of the plunger.

3,649,972
VENTILATING SYSTEM

Edward W. Sowards, Route 1, Box 705, Love Creek Road, Ben Lomond, Calif.

Filed Jan. 30, 1970, Ser. No. 7,100
Int. Cl. E03d *9/04*
U.S. Cl. 4—211 **14 Claims**



Odors are removed from toilet bowls and/or bed pans by a blower through a suction pipe, with the exhaust outlet connected to a drain through which flushing water is conducted from a toilet bowl or wash basin. The blower is operated by a switch controlled electric motor.

3,649,973
NOVEL CRIB CONSTRUCTION

Roland A. Benoit, Danielson, and John H. Curran, Norwich, both of Conn., assignors to InterRoyal Corporation, New York, N.Y.

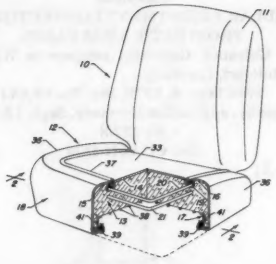
Filed May 25, 1970, Ser. No. 40,264
Int. Cl. A47d *7/00, 9/00*
U.S. Cl. 5—100 **3 Claims**

A child's crib constructed almost entirely of aluminum for relatively fault free operation and long life. The crib is provided with hollow aluminum side and end rail members which form the sides and ends of the crib and are secured to respective top and bottom terminating members by a swedging operation. A locking member is provided securing a movable side in any desired vertical position by engaging notches in a respective side rail member. A relatively friction free slide assembly is provided, enabling the sides to be moved upwardly or downwardly. A negator spring, secured to a corner post of the crib, assists the upward movement of the side and serves as an auxiliary safety device.

3,649,974
VEHICLE SEAT

Elmore J. Baruth, and Robert M. Smaxwill, both of Milwaukee, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 15, 1969, Ser. No. 885,200
Int. Cl. A47c *23/00*
U.S. Cl. 5—345 **6 Claims**

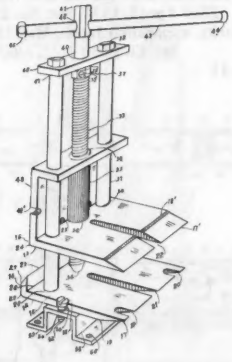


In a vehicle seat, the improvement comprising a seat cover positioned on a contoured foam cushion, both being held together by means of upper and lower parallel wires fastened together along their lengths. The lower wire is embedded in the foam cushion parallel to and below the demarcation between the seating portion and bolster portions of the upper surface of the cushion. The upper wire is entrapped within a sleeve fastened to the underside of the seat cover and is generally parallel to the lower wire. The upper and lower wires are fastened together by fastening means which pierce the sleeve.

3,649,975
SHOP TOOL

Will Ray Spurgeon, Eminence, Mo.

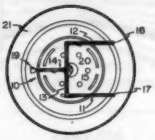
Filed Dec. 22, 1969, Ser. No. 886,845
Int. Cl. B25f *1/00;* **B66f** *15/00*
U.S. Cl. 7—1 R **2 Claims**



A shop tool of vise-like character which may or may not be secured to a supporting surface during use of the tool com-

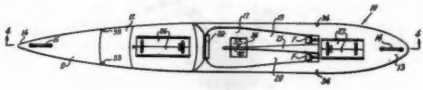
prises a pair of jaws. The jaws are provided with various cutting edges and apertures and slots for reception of nails or wire for performing various work operations thereon.

3,649,976
COMBINATION TOOL FOR USE WITH VEHICLE WHEELS
William Isom, General Delivery, Henefer, Utah
Filed Aug. 31, 1970, Ser. No. 68,077
Int. Cl. B25f 1/00
U.S. Cl. 7—1 E 2 Claims



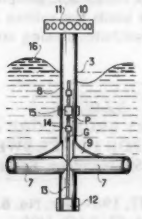
A one piece, rigid combination tool which can be used to secure a spare wheel of a vehicle in a storage position and which can be used, even by women, to quickly and easily change a vehicle wheel.

3,649,977
SELF-BAILING FORMED SKIN/SCUBA DIVER'S FLOAT
Roy E. Grabenauer, 5250 Sky Parkway, Sacramento, Calif.
Filed Jan. 27, 1970, Ser. No. 6,226
Int. Cl. B63c 9/06
U.S. Cl. 9—3 10 Claims



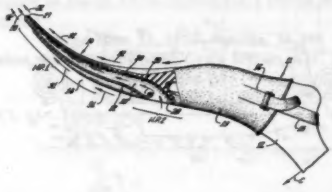
A diver's float for moving over the surface of the water to the point at which skin or scuba diving is to take place. The float is propelled by hand or a double ended paddle and has floatation consisting of a water tight compartment and foam to maintain its buoyancy. Compartments are provided both wet and dry for containing the diver's equipment while in transit. The seat for the diver is molded to fit the buttocks and legs and is provided with a hinged backrest for supporting the diver's back.

3,649,978
STABILIZED SEMI-SUBMERSIBLE PLATFORM
Georges Monnereau, Paris, France, assignor to Compagnie Generale D'Automatisme, Paris, France
Filed Dec. 10, 1969, Ser. No. 883,723
Claims priority, application France, Dec. 10, 1968, 177486
Int. Cl. B63b 35/44
U.S. Cl. 9—8 P 10 Claims



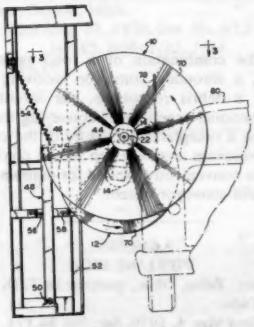
Angular stabilization and positioning of a semi-submersible platform is achieved through floating supports whose length is substantially greater than their diameter, closed at their base and vertically oriented with a cylindrical horizontal member on which the swell acts fixed to the base to compensate the angular movement it produces on the vertical supports and to position the platform in relation to the direction of its propagation.

3,649,979
SWIM FIN
Douglas K. MacNiel, Costa Mesa, Calif., assignor to U.S. Divers Co., Santa Ana, Calif.
Filed June 15, 1970, Ser. No. 46,061
Int. Cl. A63b 31/10
U.S. Cl. 9—309 17 Claims



A foot-mounted fin for use by skin divers and other swimmers, and including means to mount the fin on the foot of the swimmer and blade means to propel the swimmer through the water in response to kicking movement of the leg and foot. Water-intake (scoop) or mouth openings are provided in the top of the fin and adjacent the foot pocket or other mounting means. Water-outlet or jet-exhaust openings are provided at the tip of the blade and are directed away from the foot pocket. Wall means are provided to define nozzle passages connecting the water-intake openings with the jet-exhaust openings to thereby cause high-velocity jets of water to emanate from the blade tip, particularly during each downstroke of the foot of a swimmer who is in a face-down position.

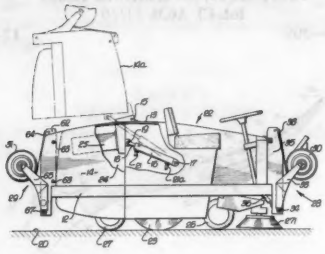
3,649,980
DIRECT DRIVE CAR WINDOW BRUSHING UNIT
Jack F. Ebeling, Portland, Oreg., assignor to Daniel C. Hanna, Portland, Oreg.
Filed Oct. 27, 1969, Ser. No. 869,841
Int. Cl. B60s 3/06
U.S. Cl. 15—21 D 6 Claims



Brushes having hollow cores fit over and enclose motors mounted on the end of an arm biased toward a car and

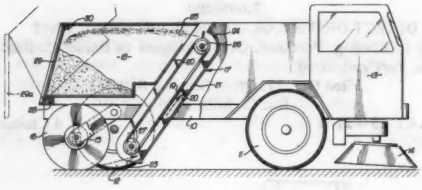
downwardly. The cores are connected by hubs to the shafts of the motors.

3,649,981
CURB TRAVELLING SWEEPER VEHICLE
Rodney L. Woodworth, Claremont, Calif., assignor to Wayne Manufacturing Company, Pomona, Calif.
Filed Feb. 25, 1970, Ser. No. 14,115
Int. Cl. B60s *9/14*; B62d *61/12*
U.S. Cl. 15—83 **17 Claims**



A road sweeper of the three wheel type having forward and rear traveling wheels is adapted for the climbing of curbs or dividers onto raised surfaces by the provision of lifter wheels bodily movable between raised and lowered positions to elevate the vehicle and its traveling wheels for movement onto and off the raised surface.

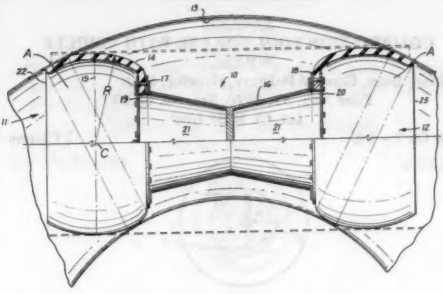
3,649,982
ROAD SWEEPER CONVEYOR SYSTEM
Donald G. Mortensen, Upland, Calif., assignor to Wayne Manufacturing Company, Pomona, Calif.
Filed Dec. 4, 1969, Ser. No. 882,143
Int. Cl. E01h *1/04*
U.S. Cl. 15—84 **2 Claims**



Employing the combination of a road sweeping rotary pickup broom, a shrouded conveyor receiving the broom sweepings and a debris receptacle, the invention departs from the conventional practices of conveying the sweepings for delivery into a receptacle forwardly of the conveyor, by carrying the sweepings over the top of the conveyor into a receptacle more conveniently located for dumping at the rear of the vehicle and conveyor system.

3,649,983
PIPELINE PIG
Burton Ver Nooy, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.
Filed May 4, 1970, Ser. No. 34,171
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 R **5 Claims**

A pipeline pig adapted to be propelled through a pipeline by fluid flowing therethrough wherein the pig has two spaced apart body supporting sections at least one of which has a curved or spherical surface which limits fluid flow past the



pig when the pig is traversing a sharp bend (e.g., a 1.5 radius ell) in the pipeline.

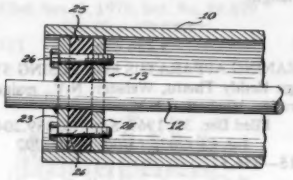
3,649,984
ROADBED BROOM AND BRISTLE
John Knox Kershaw, Knoxville, Tenn., and Edwin S. Pearce, Indianapolis, Ind., assignors to The Marmon Group, Inc., Chicago, Ill.
Continuation of application Ser. No. 745,772, July 18, 1968. This application Aug. 17, 1970, Ser. No. 64,266
Int. Cl. A46b *7/10, 13/00*
U.S. Cl. 15—179 **5 Claims**

A bristle element especially adapted for use in a broom machine for a railway roadbed or track. The bristle elements are replaceably mounted on a mandrel rotatable on a horizontal axis. The bristle elements have a core made of a bundle of parallel straight spring-steel splines or wires fixed together at one end in a detachable coupling and encased in a resilient sheath which binds the splines into mutually supporting relation and distributes flexing stress in them away from their fixed end.

3,649,985
DISPOSABLE ROTARY BRUSH CORE AND FILAMENT ASSEMBLY FOR POWER SWEEPERS
Frederick B. Hunt, 2559 Pasadena Boulevard, Wauwatosa, Wis.
Filed June 27, 1969, Ser. No. 837,052
Int. Cl. A46b *1/00*
U.S. Cl. 15—179 **4 Claims**

A disposable cylindrical brush assembly for use in power sweeping machines such as street sweepers. The cylindrical

brush is attached to a drive shaft for the machine through use of expansible elastic coupling elements which are carried by



the drive shaft and which frictionally engage the inner surface of a cylindrical core which carries the brush filaments.

3,649,986

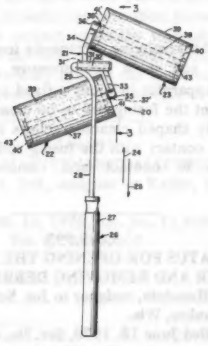
DUAL PAINT ROLLER APPLICATOR

Walter Dahlund, Kenmare, N. Dak.

Filed Dec. 9, 1969, Ser. No. 883,453

Int. Cl. A46b 7/10; B05c 1/08

U.S. Cl. 15—230.11 **1 Claim**



The invention comprises a dual paint roller applicator having a pair of rollers mounted to a bracket at angles to one another and at angles to their intended lines of travel in applying paint to a surface to create a bristling action as well as a rolling action. A handle is provided pivotally mounted to the bracket for operating the applicator.

3,649,987

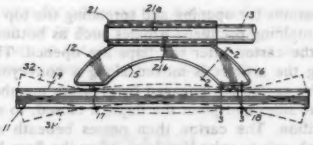
FLEXIBLE VEHICLE WIPER

Henry R. Tomingas, Route 2, Box 633, Golden, Colo., and Ralph P. Zook, 4226 Clay Street, Denver, Colo.

Filed June 8, 1970, Ser. No. 44,318

Int. Cl. A47l 1/06

U.S. Cl. 15—245 **13 Claims**



A utility wiper tool for use on curved surfaces and particularly the curved body surfaces of motor vehicles includes an elongated, flexible wiper element supported by and preferably releasably connected to an elongated flexible backing strip. The backing strip preferably is formed as a part of a one-piece wiper element support frame including a pair of opposed, relatively rigid support arms having hinge extensions joining the support arms to the back side of the backing strip at spaced points along the backing strip so as to permit the wiper element and backing strip to flex longitudinally as a unit in such a way that the wiper element will conform to curved surfaces over which it is moved. The wiper element may take the form of a relatively thin blade to dry the surface or a wider circular body made of an absorbent material to apply wax and the like.

3,649,988

WINDSCREEN WIPER ASSEMBLIES

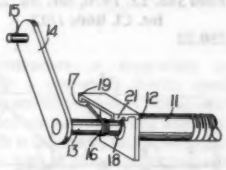
Walter Mellor, Sutton Coldfield, Warwickshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 31, 1970, Ser. No. 24,296

Claims priority, application Great Britain, Apr. 24, 1969, 21,014/69

Int. Cl. A47l 13/20

U.S. Cl. 15—250.3 **2 Claims**



In a windshield wiper assembly a bearing sleeve is secured to the vehicle body adjacent the windshield and a spindle is journalled for angular movement in said sleeve, the spindle having a windshield wiper blade at one end and being coupled to a reciprocable member at its other end for moving the windshield wiper blade over the windshield. Possible over-travel on a wet windscreen is prevented by having a part engaged with the spindle for movement therewith, the part being arrested during angular movement of the spindle in either direction from a central position so that the remainder of the movement of the spindle in that direction takes place relative to said part the friction between said part and the spindle minimising the possible over-travel.

3,649,989

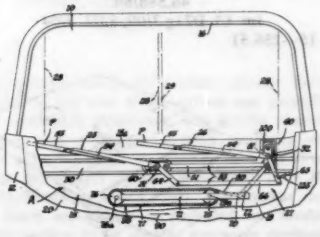
TRANSVERSE WIPER APPARATUS

Eric G. Parker, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1970, Ser. No. 67,514

Int. Cl. B60s 1/32, 1/44

U.S. Cl. 15—250.16 **6 Claims**



In a preferred form, this disclosure relates to a windshield wiping apparatus which includes a windshield wiper and an

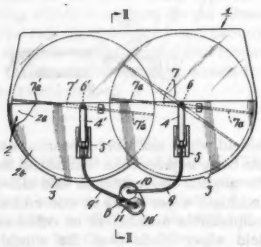
actuating mechanism operatively connected with the wiper for reciprocating the latter transversely of the windshield while maintaining the wiper in a generally vertical disposition between first and second positions during running operation and for moving the wiper between a parked position adjacent the lower edge of the windshield and its generally vertical run position when operation is initiated and terminated. The actuating mechanism includes a generally horizontally extending guide track, a trolley operatively connected with the wiper and which is supported and guided for reciprocable movement through a first path by the guide track during running operation, and a parking means including an auxiliary guide track pivotally supported by the main guide track. The auxiliary guide track is selectively movable into the path of movement of the trolley and serves to guide the trolley for movement through a second path transversely of the first path to cause the wiper operatively connected therewith to be moved from its generally vertical run position toward its park position when operation is being terminated.

3,649,990

WIPER DEVICE FOR THE FRONT WINDOWPANE OF A MOTOR-VEHICLE

Shosaku Saito, 2, 7 Suruza-cho, Shizuoka, Japan

Filed Jan. 12, 1970, Ser. No. 2,068
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.22 **9 Claims**



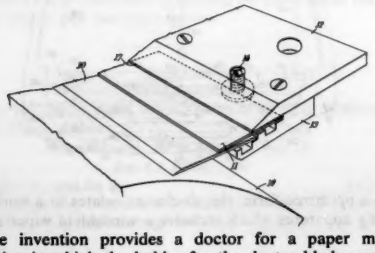
A wiper device for the windshield of an automobile and similar vehicles in which wiper members adapted to rotate across the windshield in frictional contact with the outer surface thereof are carried by rotary stub shafts rotatably supported by hollow members. Flexible shafts are connected at one end to the rotary shafts for rotating the shafts and gears having shafts are connected to the other ends of the flexible shafts and a drive motor for driving the gears.

3,649,991

DOCTORS FOR PAPER MAKING MACHINES

Roger Anthony Grimston, Hemel Hempstead, and Albert Henry John Boyland, London, both of England, assignors to Vickerys Limited, London, England

Filed Sept. 26, 1969, Ser. No. 861,409
Claims priority, application Great Britain, Oct. 1, 1968, 46,588/68
Int. Cl. D21g *3/00, 3/02, 3/04*
U.S. Cl. 15—256.51 **7 Claims**



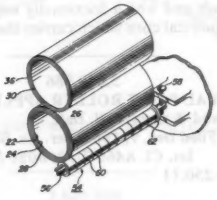
The invention provides a doctor for a paper making machine in which the holder for the doctor blade carries a series of spaced members which are individually adjustable, without any distortion of the blade holder itself, to vary the doctoring pressure applied by the blade at different zones along its length.

3,649,992

CLEANING APPARATUS FOR FUSING SYSTEM

Raghulinga Reddy Thettu, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,204
Int. Cl. G03g *15/00*; B03b *1/02*
U.S. Cl. 15—256.52 **6 Claims**



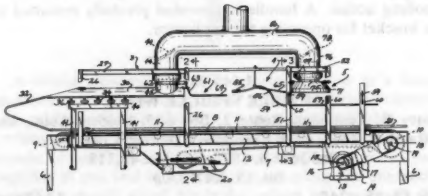
Apparatus for removing extraneous toner particles from a heated fuser roll in a heat-pressure xerographic fusing system. The apparatus includes a fixed cylindrical rod positioned adjacent the fusing roll to be cleaned and a plurality of cylindrically shaped cleaning rollers rotatable about the rod in rolling contact with the fusing roll. The cleaning rollers function to contact and remove toner particles therefrom.

3,649,993

APPARATUS FOR OPENING THE FLAPS OF A CONTAINER AND REMOVING DEBRIS THEREFROM

Henry Sauer, Honolulu, assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed June 18, 1970, Ser. No. 47,500
Int. Cl. A47l *25/00*
U.S. Cl. 15—304 **19 Claims**



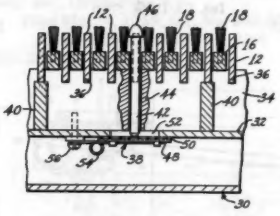
An apparatus for opening and spreading the top flaps of a carton containing packaged articles such as bottles, and for cleaning the carton after the flaps are opened. The carton containing the articles is moved along a conveyor and the sides of the carton are engaged by pressure members which deform the sides and pivot the flaps, if closed, to a partially open position. The carton then passes beneath a vacuum duct, which acts to raise the flaps. After the flaps have been raised, the carton moves into engagement with a spreader unit which spreads the flaps laterally outward. With the flaps in the spread position, the carton is then conveyed beneath a second vacuum duct which acts to draw lightweight debris from the carton.

3,649,994

PEDESTRIAN FOOTWEAR CLEANER

Ewell J. Harris, Sunset Mobile Homes Route #3, Box 135A, Adrian, Mich.

Filed Nov. 9, 1970, Ser. No. 88,009
Int. Cl. A47l 7/02
U.S. Cl. 15—311 7 Claims



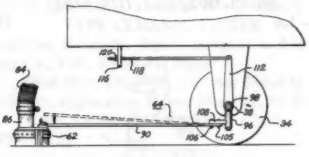
A footwear cleaner utilizing a plurality of foot operated vacuum controls which cause suction to be directed at the foot of a pedestrian. The device comprises a foot support grid and individually operated zoned vacuum directing means and preferably also includes reciprocation footwear contacting elements which project upwardly through the grid to mechanically loosen dirt from the bottom of the pedestrian's feet. Air flow downwardly around the footwear carries the dirt to a vacuum actuated dirt collection system.

3,649,995

FLOOR MAINTENANCE MACHINE

Wayne Ison, Elkhart, Ind., assignor to Keltec, Inc., Elkhart, Ind.

Filed Feb. 16, 1970, Ser. No. 11,506
Int. Cl. A47l 7/00
U.S. Cl. 15—320 9 Claims



A floor cleaning machine having a scrubbing means near the forward end of the body, a system for supplying a cleaning solution to the scrubbing means, and a system for recovering the used solution, said latter system having in conjunction therewith a squeegee device near the rear end of the machine, and a spring bar connected to a support near the center of the machine on the underside thereof and applying a downward pressure on the device. A means is included in the mechanism for adjusting the downward pressure applied by the spring bar to the device, and the spring bar, while applying pressure to the device, flexes to permit the squeegee device to readily pass over uneven floor areas.

ERRATUM

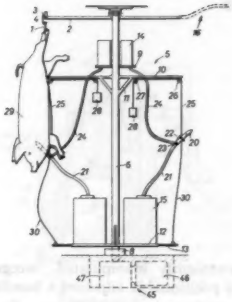
For Class 16—11 see:
Patent No. 3,649,997

3,649,996

DEVICE FOR WITHDRAWING BLOOD FROM BODIES OF SLAUGHTERED ANIMALS

Erich Marti, Hauptstrasse 74, Othmarsingen, Switzerland

Filed July 20, 1970, Ser. No. 56,421
Claims priority, application Switzerland, July 21, 1969, 11127/69
Int. Cl. A22b 5/04
U.S. Cl. 17—1 C 10 Claims



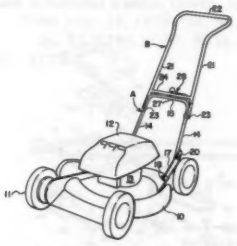
The device comprises a supporting arm moving synchronously with a conveying device upon which the slaughtered animals are suspended. A hollow sticking knife is adjustably suspended on the supporting arm and the vertical position of the knife is limited by an anchoring cable. A hose connects the knife with a blood collecting container. The conveying device is, at the end of the path for the blood withdrawing operation, directed upwards to that the anchor cable automatically removes the sticking knife from the finished body.

3,649,997

FOLDING HANDLE LATCH

Richard A. Thorud, Minneapolis, Minn., assignor to Toro Manufacturing Corporation, Minneapolis, Minn.

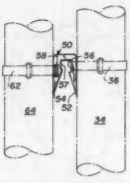
Filed Aug. 22, 1969, Ser. No. 852,296
Int. Cl. A47b 95/02; A47j 45/00; B62b 1/08
U.S. Cl. 16—111 5 Claims



A folding steering handle for a rotary mower, the handle being attached to the rear of the mower and extending upwardly and rearwardly therefrom. The handle consists of a lower section and an upper section pivotally attached thereto, said upper section being capable of being swung forwardly from an upright operating position to a lowered generally horizontal position over the mower housing. Releasable latch mechanism is provided for holding the upper handle section in an upright operative position. This latch mechanism comprises a latch pin which seats in aligned openings in the frame structure of the upper and lower han-

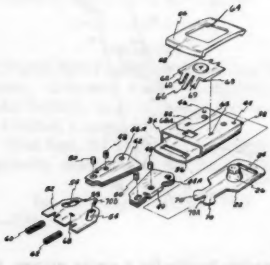
dle sections, said latch pin being held in position and manipulated by a handle attached thereto which is formed of spring wire which biases the pin toward latching position.

3,649,998
COUPLING ADAPTOR
Arthur A. Fiorentino, Piscataway, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Jan. 12, 1971, Ser. No. 105,850
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 PB **17 Claims**



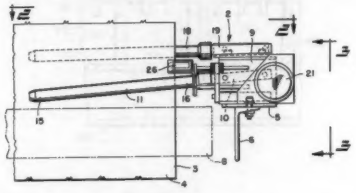
A barbed, conveniently manipulated, integral coupling adaptor wedgingly positionable adjacent a bundled article to permit a further article to be joined thereto. Strap receiving portions suitably contoured to provide selective strap receiving passages are disposed adjacent and contiguous with a generally wedge-shaped portion of the device arranged to facilitate the insertion thereof between a bundling strap and an article bundled therewith, the bundling strap being positionably restricted within an appropriately recessed first strap receiving portion. A second strap receiving portion is disposed either normal to or in aligned relationship with the first strap receiving portion, and is arranged to receive a further bundling strap positionable about a further article generally adjacent the first article, to effect a secure coupling therebetween.

3,649,999
REFLEX SEAT BELT BUCKLE
Robert W. Stoffel, Ferndale, Mich., assignor to Jim Robbins Seat Belt Co., Mount Clemens, Mich.
Filed May 22, 1969, Ser. No. 826,965
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 **3 Claims**



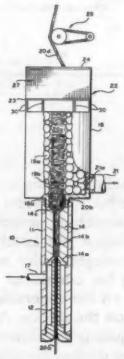
A push button seat belt buckle having a tongue which is received in a buckle housing to connect a pair of belts together. As the tongue is being received, it moves a release plate toward a position in which a push button prevents the release plates return motion. The release plate, in turn, pivots a pair of latch members toward the tongue to prevent its removal from the housing. The tongue is released by operating the push button to free the release plate for its return motion which allows the latch members to be disengaged from the tongue by its removal from the housing.

3,650,000
WEB GUIDING AND EXPANDING APPARATUS
Alexander V. Alexeff, Cleveland, and Harvey Snyder, Bay Village, both of Ohio, assignors to Alexeff-Snyder Enterprises, Inc., Cleveland, Ohio
Filed Apr. 6, 1970, Ser. No. 31,047
Int. Cl. D06c *3/06*
U.S. Cl. 26—65 **20 Claims**



Web guiding and expanding apparatus including a single expander roll adjacent each edge of the web material having one end desirably carried by a pivotal link for raising and lowering of the expander rolls into and out of engagement with such web material. The other end of each expander roll may either be free to move or may be relatively fixed except for annular movement. One end of such expander rolls may also be mounted for lateral movement relative to the other end to permit adjustment of the angle of cant of the rolls, or the entire frame which supports the rolls may be mounted for pivotal movement about an axis perpendicular to the normal path of travel of the web material to permit such adjustment.

3,650,001
YARN TEXTURING APPARATUS
Ronnie D. Nikkel, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 24, 1970, Ser. No. 101,332
Int. Cl. D02g *1/12, 1/16, 1/20*
U.S. Cl. 28—1.6 **10 Claims**



Yarn is textured by passage at an elevated temperature into a zone of turbulence. The resulting textured yarn is passed through a first chamber which contains a plurality of stacked members, such as balls. These members exert a force on the yarn to produce a confined wad. The wad is directed from the first chamber into a second chamber which contains stacked members and a flexible tapered retaining member to

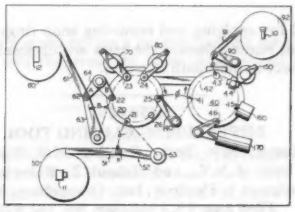
facilitate the breaking up of the yarn wad. Fluid employed to produce the turbulence zone is separated from the textured yarn in the first chamber.

3,650,002

MACHINERY FOR MAKING CRT ELECTRONIC ASSEMBLIES USING TWO INDEXING TABLES

Chester O. Merchant, Owensboro, Ky., assignor to Kentucky Electronics Inc., Owensboro, Ky.

Filed Mar. 4, 1969, Ser. No. 804,077
Int. Cl. H01j *9/06, 9/10, 9/46*
U.S. Cl. 29—25.19 **5 Claims**



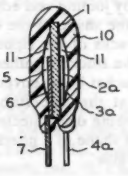
Apparatus providing for automatic manufacture of a portion of an electron gun in a cathode ray tube utilizes two conjointly operated indexing tables with an intermediate transfer mechanism to assemble, fit, stake and weld in place a series of parts. At a series of indexing positions parts are loaded, checked and processed with such manufacturing steps as cutting, positioning and welding a lead tab to a cathode cylinder. The use of two tables permits high strength for staking operations, greater production in a given time, and accessible layout of equipment in a small space.

3,650,003

METHOD OF MANUFACTURING AN ENERGY TRAPPED TYPE CERAMIC FILTER

Isao Toyoshima, Kyoto-fu, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan

Filed Mar. 19, 1969, Ser. No. 808,494
Claims priority, application Japan, Mar. 21, 1968, 43/18383
Int. Cl. B01j *17/00;* **H04r** *17/00*
U.S. Cl. 29—25.35 **7 Claims**



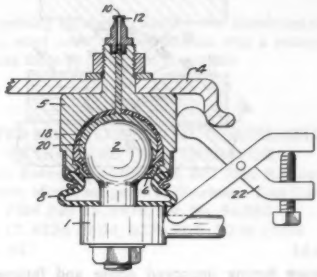
Method of manufacturing an energy trapped type ceramic filter. The method comprises forming a thin layer of thermofusing material on and about the resonator electrode portions. Thereafter an insulative resinous outer layer is placed on the thermofusing material to cover all the portions. A gap or gaps between said resonator electrode and said outer layer is formed by heating the assembly for causing the thin layer to be fused and to be absorbed into said outer layer.

3,650,004

BEARING REPAIR

Theodore R. Bergstrom, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company

Continuation-in-part of application Ser. No. 678,431, Oct. 26, 1967, now abandoned, and a continuation-in-part of 848,672, Aug. 8, 1969. This application Dec. 22, 1969, Ser. No. 887,431
Int. Cl. B21d *53/10*
U.S. Cl. 29—149.5 B **8 Claims**



A process for the repair of worn ball and socket joints, journal bearings, and the like, in which the bearing parts are prepositioned in operative relationship and, in the case of ball joints, at an extreme of the range of movement in the direction of separation of the parts, lubricating the joint if dry, and then injecting through the greasing orifice, or through an opening at the end of the bearing, a bearing composition comprising a hardenable resin in fluid form, the viscosity of which is at least slightly greater than that of bearing grease, and which on hardening has an impact hardness of the order of not less than about 500 p.s.i.

3,650,005

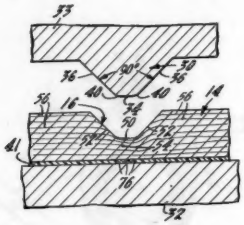
METHOD FOR PRODUCING TUBE IN SHEETS

Osamu Kamiya, Osaka; Yuichiro Asano, and Tomiyoshi Kanai, both of Tochigi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1970, Ser. No. 20,972
Int. Cl. B21d *53/02;* **B21k** *29/00*
U.S. Cl. 29—157.3 V **5 Claims**

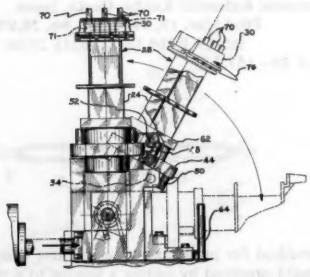
A method for producing tube in sheet is applied a pasty stop weld prepared by adding a solvent to a zinc powder or powdered zinc alloy having a purity of at least about 90 percent and kneading the resultant mixture. This stop weld material is applied, in desired pattern, between at least two aluminum sheets, which are then roll-bonded with part left nonbonded where the stop weld is applied. The coalesced sheets are thereafter annealed, whereby the sheets are softened to the extent suitable for the subsequent treatment while the zinc or zinc alloy serving as the stop weld is diffused into the inner faces of the aluminum sheets to form aluminum zinc layers. In the last step, a highly pressurized fluid is forced into the nonbonded portion, which is therefore distended into a tubular form to provide a passage.

3,650,006
SCORE MANUFACTURE
Christian F. Kinkel, Arlington Heights, Ill., assignor to American Can Company, New York, N.Y.
Filed Dec. 11, 1968, Ser. No. 782,919
Int. Cl. B21d *17/02*; B65d *17/00*
U.S. Cl. 29—190 4 Claims



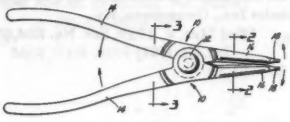
A score having improved abuse and fatigue resistance qualities is formed by using a scoring punch which is specially profiled to obtain a smooth continuous flow of the displaced metal, thereby eliminating the "dead zone" of compressed, work-hardened metal which exists at the base of conventional scores.

3,650,007
INDEXING DEVICE FOR A BOBBIN
Thomas M. Seltzer, Lewisberry, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.
Filed Oct. 1, 1970, Ser. No. 77,301
Int. Cl. H05k *13/04*; H01r *43/04*
U.S. Cl. 29—203 R 10 Claims



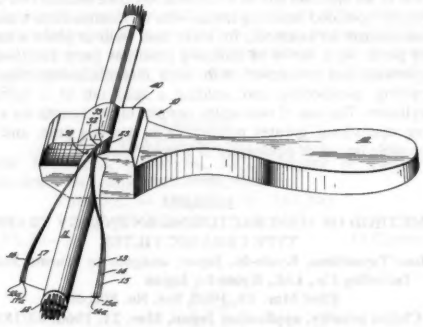
Apparatus for automatically positioning a bobbin relative to a bobbin lugger so that lugs are attached to both sides of the bobbin. The apparatus locates the bobbin in a work position for the reception of lugs in a first part of the bobbin, and then moves the bobbin away from the work position and returns the bobbin to the work position while simultaneously rotating the bobbin to present another part of the bobbin for the reception of lugs.

3,650,008
TOOL FOR SNAP RINGS
Emile P. Plouffe, Solon, Ohio, assignor to Millar Corporation, Chagrin Falls, Ohio
Filed Feb. 17, 1970, Ser. No. 12,033
Int. Cl. B23p *19/04*
U.S. Cl. 29—229 3 Claims



A tool for applying and removing snap rings to and from shafts and bores, wherein the jaws are disposed at an angle with respect to their path of travel.

3,650,009
ZIPPERTUBING CLOSING TOOL
Steven Ausnit, New York; Gunther Max Sommer, Pearl River, both of N.Y., and Helmut Z. Haberle, Northvale, N.J., assignors to Flexigrip, Inc., Orangeburg, N.Y.
Filed Aug. 15, 1968, Ser. No. 752,920
Int. Cl. B23p *19/02*
U.S. Cl. 29—235 11 Claims

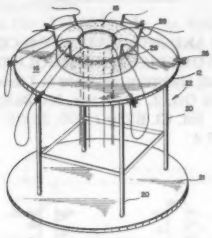


A tool for joining a zippertube (a flat sheet of vinyl with interlocking tracks along its edges which can be formed (zippered) into a tube by joining said edges) around a cable, that has an opening in the shape of the cable to be covered and that lines up the tracks of the zippertube and then engages them by pressing the tracks together between the outer surfaces of the cable jacket being covered and the inner surface of the tool. So that the zippertube can also be attached without the cable being disconnected at both ends, the tool may be made in the shape of a pliers that is opened and then closed around the cable.

3,650,010
BEAD STRINGER
Edgar S. Powell, Jr., 7834 E. Northland Drive, Scottsdale, Ariz.
Filed June 9, 1969, Ser. No. 831,565
Int. Cl. B23p *14/04*
U.S. Cl. 29—241 2 Claims

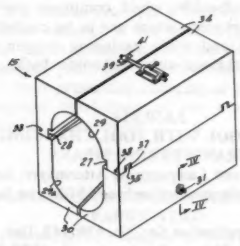
Method for stringing beads wherein a plurality of cords, not less than six, are paired and the cords of each pair are

crisscrossed in a horizontally run through a bead, resulting in a re-pairing, which pair is then vertically run through a bead



together with a stand having a central opening for practicing the method and the resultant three dimensional string of beads.

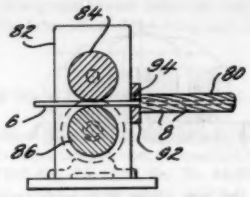
3,650,011
DEVICE FOR CLOSING FASTENERS
Steven Ausnit, 124 East 61st Street, New York, N.Y.
Filed Mar. 24, 1970, Ser. No. 22,243
Int. Cl. A44b *19/14, 19/26*
U.S. Cl. 29—243.57 **8 Claims**



A method of and apparatus for securing an enclosing, wrap-around member applied about an object having pressure-resistant surface, and wherein the member has pressure interlockable, i.e., plastic hook zipper, fastener comprising complementary portions along adjoining edges and wherein one of the portions is backed against the object, the other of the portions being moved into registering alignment with the backed portion and pressure exerted to drive the registering portion into interlocked engagement with the backed portion utilizing the object as the base toward which the pressure is applied. A grooved tunnel slider is provided as the means for effecting the fastener closing.

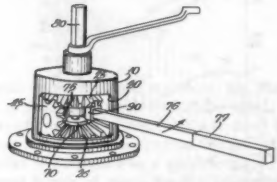
3,650,012
PROCESS AND APPARATUS FOR RECOVERING METALS FROM CABLES
Fred J. Graveman, St. Charles, Mo., assignor to Aluminum Converter Sales & Research, Inc., St. Charles, Mo.
Filed Dec. 17, 1969, Ser. No. 885,676
Int. Cl. B23q *17/00*
U.S. Cl. 29—403 **19 Claims**

Aluminum is recovered from steel reinforced aluminum cable (ACSR cable) by first straightening the cable and thereafter cutting the strands of aluminum away from the steel core at the end of the cable so as to expose a short portion of the core. Next, the cable is severed so that the exposed portion of the core is disposed at the end of a relatively short segment of cable. The steel core is then withdrawn from the surrounding aluminum strands by passing its exposed portion through an opening and pulling it while the ends of the aluminum strands abut against the member in



which the opening is formed. Finally, the aluminum strands, freed of the steel core, are introduced into a rotary shear which reduces them to pellet size fragments.

3,650,013
LIMITED SLIP DIFFERENTIAL DISASSEMBLY METHOD AND TOOL THEREFOR
Jan H. Boers; Robert C. Rutherford, and John R. Loquai, all of Owatonna, Minn., assignors to Owatonna Tool Company
Filed July 15, 1970, Ser. No. 54,885
Int. Cl. B23p *19/04;* **B23b** *9/00;* **B25b** *27/00*
U.S. Cl. 29—427 **14 Claims**

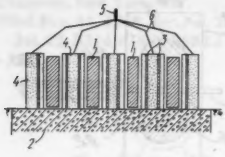


A tool for assembly and disassembly of a limited slip differential including a step plate engageable against one side gear of the differential, an internally-threaded member engageable against the other side gear of the differential, a forcing screw threadable into the threaded member and engageable with the step plate whereby rotation of the forcing screw forces increased separation of the side gears relative to each other by compressing of a Belleville spring between each side gear and the differential case to free the pinion mate gears for inward movement to remove washers associated therewith, and a handle member connected to the internally-threaded member extendable outwardly of the differential case and provided with a pawl engageable with a tooth on a side gear to result in rotation of the engaged side gear and a pair of pinion mate gears of the differential to cause the latter to walk on the other side gear until the pinion mate gears are positioned for removal through openings in the differential case, with the rotation of the handle being about an axis defined by the forcing screw, together with a method of disassembling a limited slip differential by use of a tool as described above.

3,650,014
METHOD OF EXPLOSIVE WELDING OF METAL PLATES
Alexandr Fedorovich Demchuk, Akademicheskoya ulitsa 25, kv. 47; Andrei Andreevich Deribas, ulitsa Pravdy, 1, kv. 20, both of Novosibirsk; Vladimir Mikhailovich Kudinov, ulitsa Filatova 1/22, kv. 51, Kiev; Felix Iovich Matveenkov, ulitsa pravdy, 1. Kv. 24; Valery Alexandrovich Simonov, bulvar Molodezhi, 30, Kv. 19, both of Novosibirsk, all of U.S.S.R.
Filed Aug. 15, 1969, Ser. No. 850,382
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **54 Claims**

Metal plates are welded together by spacing base plates

apart in a horizontal row and interdigitating pairs of plates to



be welded to the base plates along with explosive charges which are placed between the plates of the pairs.

3,650,015

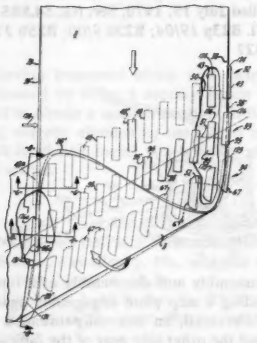
HELICAL PIPE MAKING METHOD

Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Filed Feb. 4, 1969, Ser. No. 796,437

Int. Cl. B23k *31/02*

U.S. Cl. 29—477.7 **3 Claims**



Apparatus for and method of helically forming pipe from an elongated strip of metal. The elongated strip is curled between the rolls of a three-roll strip curling apparatus into a curved path, with the rolls exerting lateral forces on the strip during curling for guiding the strip so that such curved path is in the form of a helical convolution in which the trailing edge of a preceding portion of the strip converges into contact with the leading edge of a following portion thereof.

3,650,016

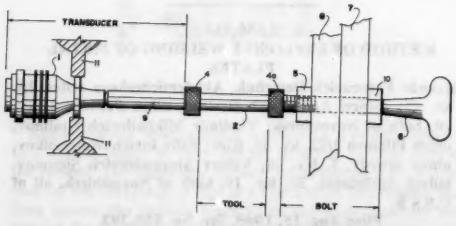
PROCESS FOR TORQUING THREADED FASTENERS

Robert C. McMaster, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed Apr. 28, 1969, Ser. No. 819,885

Int. Cl. B23p *19/00*

U.S. Cl. 29—526 **8 Claims**



The disclosure is a method of applying high-efficiency sonic transducers to torquing threaded fasteners whereby any of a range of desired tension stress levels may be obtained in said threaded fastener. Reference is made to the claims for a legal description of the invention.

3,650,017

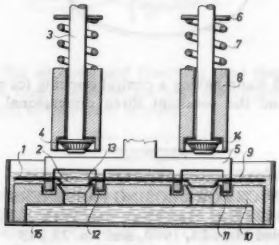
METHOD AND APPARATUS FOR COATING A WORKPIECE WITH SOLDER

Pal Gal, Budapest, Hungary, assignor to Licencia

Filed Oct. 2, 1969, Ser. No. 863,247

Int. Cl. B23p *17/00, 25/00*

U.S. Cl. 29—527.4 **16 Claims**



A process for coating a workpiece of light metal or light metal alloy with soft-solder which comprises working those surfaces of the workpiece which are to be coated in an oxygen-free medium and while excluding oxygen therefrom contacting said workpiece with a soft solder bath.

3,650,018

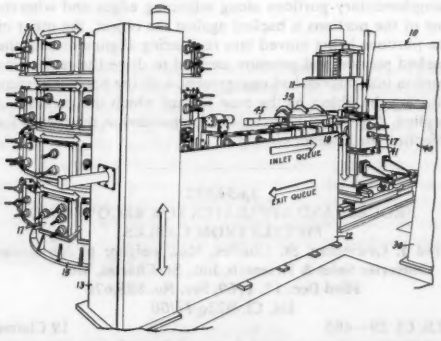
MACHINE TOOL WITH TOOL CHANGING AND TRANSFERRING MEANS

Charles B. Perry, and Lawrence A. Attermeyer, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Continuation of application Ser. No. 690,942, Dec. 15, 1967, now abandoned. This application Aug. 6, 1970, Ser. No. 61,870

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **14 Claims**



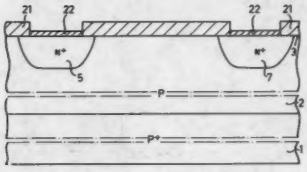
This invention relates to a machine tool and, more particularly, to apparatus for use in a manufacturing plant having in storage a number of tool modules which can be attached to and operated by a spindle, the particular module being selected in accordance with the character of a particular workpiece presented to the apparatus.

3,650,019

METHODS OF MANUFACTURING SEMICONDUCTOR DEVICES

David Phythian Robinson, Stanmore, England, assignor to U.S. Philips Corporation

Filed Dec. 29, 1969, Ser. No. 888,543
Claims priority, application Great Britain, Dec. 31, 1968, 61,953/68
Int. Cl. B01j *17/00*; H01g *13/00*
U.S. Cl. 29—571 20 Claims



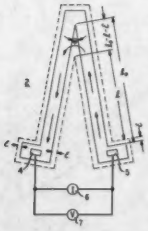
A method of implanting ions in a semiconductor body in which a thin conductive layer is applied on the surface parts or surface adjacent parts at which the ion beam is to be directed. The ions penetrate the thin layer which maintains the surface parts or surface adjacent parts, including metal electrode layers when present, at a common potential. By suitable connection of the thin layer charging of said parts during implantation can be prevented. Subsequent to implantation the thin conductive layer is removed without effecting any substantial removal of the surface parts or surface adjacent parts. The specification describes the manufacture of a tetrode insulated gate field effect transistor, the applied thin conductive layer preventing charging of the gate electrodes and consequent breakdown of the underlying insulating layers during ion implantation.

3,650,020

METHOD OF MONITORING SEMICONDUCTOR DEVICE FABRICATION

Jerry Mar, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 24, 1970, Ser. No. 13,488
Int. Cl. B01j *17/00*; H01l *7/00*
U.S. Cl. 29—574 4 Claims



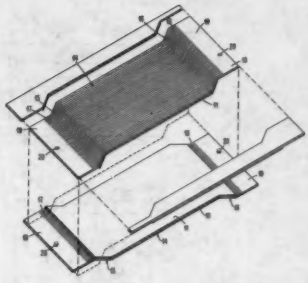
A method is described for monitoring the extent of lateral and vertical diffusion of the emitter and base regions of transistor elements during the production of integrated circuits. A V-shaped mask pattern is utilized to form a V-shaped resistor in the semiconductor wafer of the circuit. Lateral diffusion will cause a small increase in leg width of the resistor relative to the original pattern, resulting in a shift in the position of the notch of the V-shaped resistor relative to the pattern which thereby results in a correspondingly large decrease in leg length, as measured from the base of the leg to the notch. Measurement of the resistance around the path of the resistor determines the change in leg length from which can be calculated the extent of lateral diffusion. The latter value can then be used to estimate junction depth. Following the teachings of this invention, the extent of oxide etching and photographic mask definition may also be monitored during the fabrication of the integrated circuit.

3,650,021

METHOD OF MANUFACTURING A TUBULAR PRINTED CIRCUIT ARMATURE

Kenneth N. Karol, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1970, Ser. No. 66,938
Int. Cl. H02k *15/02*, *15/10*
U.S. Cl. 29—598 14 Claims



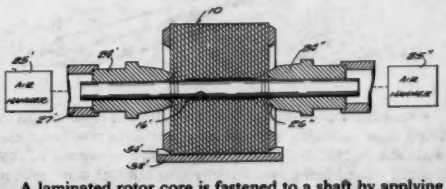
A tubular printed circuit armature, for use in an electric machine, is produced from two flexible cards, each card having a layer of conductive metal and a layer of insulation, such as a fully-cured epoxy-impregnated fiberglass layer. The layer of insulation is patterned in a predetermined manner to expose spaced bands of metal on the insulation side of each card, as by printed circuit techniques, so that interconnecting tabs of the winding conductors extend into the spaced bands of metal. The mating surfaces of the cards are then coated with an adhesive which will subsequently bond the cards together under a heat and pressure environment. The cards are then rolled about a high temperature coefficient mandrel, with the interconnecting tabs of one card in registry with the interconnecting tabs of the other card, and with the cards axially overlapping one another at the ends which form the axial seam of the tubular armature. The mandrel is then placed in a low temperature coefficient shell; and the shell is subjected to an elevated temperature, to thus form a unitary tube out of the two cards. The tube is then removed and the tabs are electrically connected to form the armature winding.

3,650,022

METHOD OF ASSEMBLING THE ROTOR PAD SHAFT OF A DYNAMOELECTRIC MACHINE

Thomas W. Stone, Owosso, Mich., assignor to The Singer Company, New York, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,499
Int. Cl. H02k *15/02*, *15/10*
U.S. Cl. 29—598 19 Claims



A laminated rotor core is fastened to a shaft by applying a series of impact blows to an annular area surrounding the

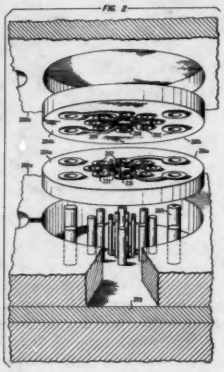
core opening into which the rotor shaft extends. This indents the laminations at the annular area and the lamination material within the annular area, i.e., between the annular area and the core opening, expands radially inward to grip the shaft.

3,650,023

METHOD FOR FABRICATING FERRITE CORE PLUG-IN DEVICES

Peter S. Kubik, South Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 8, 1969, Ser. No. 848,610
Int. Cl. H01f 7/06
U.S. Cl. 29—602 10 Claims



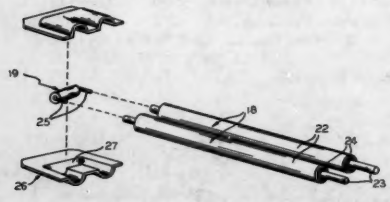
Plastic encapsulated ferrite core plug-in units are fabricated by an injection molding technique utilizing a hollow mold. Conducting paths on and through the units are transferred from the mold to the units such that the conducting paths are in a plane different from the nonconducting surface of the units. Copper plating applied to the entire unit is then removed from the plane established by the nonconducting surfaces only.

3,650,024

TEMPERATURE SENSITIVE CONTROL SENSOR

Phillip F. Finney, Villa Park, Ill., assignor to Thermo-Couple Products Company, Inc., Winfield, Ill.

Filed Nov. 21, 1969, Ser. No. 878,832
Int. Cl. H01c 15/04, 17/00
U.S. Cl. 29—615 6 Claims



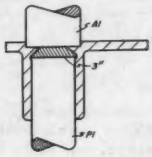
A sensor for controlling the temperature of a metal, gas or liquid mass including a temperature sensitive resistance element constructed and arranged in a casing or sheath so that it is capable of being cast directly into a metal mass, placed directly into a gas mass, or placed directly into a liquid mass, wherein the elements of the sensor will withstand the high temperatures in casting processes and/or the environs of a gas or liquid mass, and maintain its integrity.

3,650,025

PROCESS OF FORMING ELECTRICAL CONNECTORS

Bernard John McLaughlin, St. Louis, and Arthur Louis Colvis, Hazelwood, both of Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,918
Int. Cl. H02g 15/00; H01r 9/00
U.S. Cl. 29—629 6 Claims



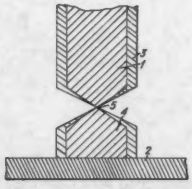
Electrical connector or terminal lugs are provided by using bending, stretching and drawing techniques rather than cold flow methods. To fabricate the terminal lugs, a flat piece of aluminum or copper is first formed as a cup by drawing techniques. Then, the closed end of the cup is sheared free, flattened and wedged within the walls of the cup. Afterward, suitable holes are punched or drilled to accept wires, or cables, and fasteners. The resulting terminal lugs may be used in fastening wires or cable to bus bars.

3,650,026

METHOD OF FORMING A CONTACT

Albert Leslie Freeman, Harlow, England, assignor to International Standard Electric Corp., New York, N.Y.

Filed Aug. 1, 1969, Ser. No. 846,710
Claims priority, application Great Britain, Aug. 21, 1968, 39,925/68
Int. Cl. H01r 9/00
U.S. Cl. 29—630 C 4 Claims



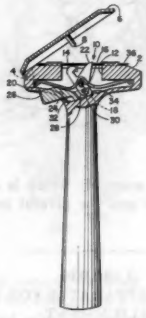
Electrical contacts are produced by welding the ends of coated contact wires to strips of springs metal. The welded end of each of the wires is severed from the remainder of the wire leaving a chisel-ended stud welded to the spring strip. This stud is then subjected to a die forming operation to produce a shaped contact.

3,650,027

RAZOR HEAD

Charles F. Stephenson, Rowayton; Kenneth A. Van Dyck, Weston, and James B. Wyatt, Stamford, all of Conn., assignors to The Gillette Company, Boston, Mass.

Filed Apr. 8, 1970, Ser. No. 26,588
Int. Cl. B26b *21/30, 21/32*
U.S. Cl. 30—58 9 Claims



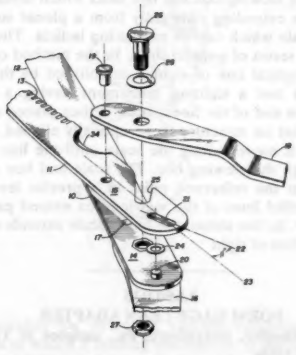
A razor head having a cap portion mounted thereon and adapted to pivot upon one end of the razor head, the cap being held and released by a hook latch means disposed in the razor head.

3,650,028

COMPOUND ACTION SHEARS

Gabriel M. La Pointe, Worcester, Mass., assignor to Parker Mfg. Company, Worcester, Mass.

Filed Apr. 24, 1970, Ser. No. 31,488
Int. Cl. B25b *7/06;* B26b *13/28*
U.S. Cl. 30—238 5 Claims



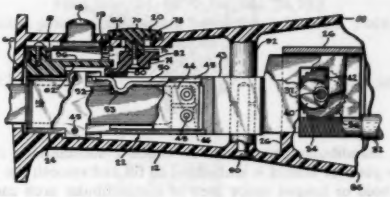
Hedge shears having increased cutting efficiency and operator shock isolation are provided by this invention. Improved cutting efficiency is provided by a cam actuated force multiplier interconnection of the blades. Shock isolation is provided by the use of resilient means to limit the blade travel.

3,650,029

ELECTRIC KNIFE BLADE SECURING AND SAFETY SWITCH DEVICE

William F. Trelc, Boonville, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 4, 1970, Ser. No. 34,485
Int. Cl. B26b *7/00*
U.S. Cl. 30—272 10 Claims



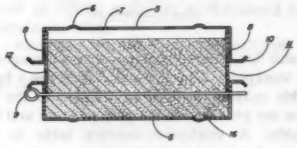
An electric knife having reciprocating carriages supporting adjacent cutting blades, a flexible blade retainer on each carriage cooperating with a blade recess for releasably holding the blade and carriage together, an on-off switch for powering the knife, and a combination blade and safety switch lock device operable in one position to cooperate with the blade retainer only to preclude blade removal while allowing switch operation and operable in a second position to cooperate with the switch only to preclude powering of the knife while allowing removal of the blades.

3,650,030

CHEESE MOLD

Richard William Delamere, Peterborough, Ontario, Canada, assignor to De Laval Company Limited, Peterborough, Ontario, Canada

Filed Feb. 4, 1970, Ser. No. 8,561
Int. Cl. A01j *25/13*
U.S. Cl. 425—408 8 Claims

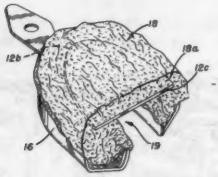


Upper and lower receptacles adapted to define a mold cavity are duplicates of each other so that they are interchangeable. Releaseable means support a sleeve in the lower receptacle above its bottom and with the upper portion of the sleeve adapted to protrude into the upper receptacle to space the latter vertically from the lower receptacle; and after filling the lower receptacle and this sleeve protrusion with the cheese curd and then applying the upper receptacle, the supporting means are released so that the sleeve slides toward the bottom of the lower receptacle as the curd-pressing operation forces the upper receptacle downward relative to the lower one. Handle members integral with the receptacles serve to reinforce their side walls.

3,650,031
MANDIBULAR DENTAL CAST AND METHOD OF MAKING SAME

Douglas J. Shilliday, 1501 London Drive, Upper Arlington, Ohio

Filed July 7, 1970, Ser. No. 52,864
Int. Cl. A61c *19/00*
U.S. Cl. 32—1 5 Claims

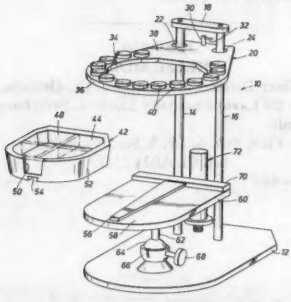


A mandibular dental cast in which a substantially rigid, filler plate or matrix is embedded to fill and smooth the central void or tongue space area of a mandibular arch casting formed in a dental impression mold; the filler plate or matrix being of generally parabolic outline and being at least partially embedded in the plaster or plastic casting as it is being formed in the impression mold.

3,650,032
MAGNETIC TOOL-POSITIONING APPARATUS

Ralph Kestler, Houston, Tex., assignor to Glynn E. Perkins

Filed Feb. 11, 1970, Ser. No. 10,326
Int. Cl. A61c *13/00*
U.S. Cl. 32—11 13 Claims



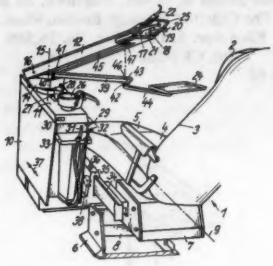
An apparatus for positioning one or more magnetic tools relative to a workpiece. The apparatus includes a base and a magnetic table movably supported relative to the base. Indexing means are provided to roughly position and index the magnetic table. A workpiece-support table is rotatably mounted on the base and is positioned to receive a magnetic tool carried by the magnetic table. The apparatus finds particular utility in the dental art for making replica of teeth.

3,650,033
DENTAL TREATMENT UNITS

Ernst-August Behne, and Otto Fleer, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 20, 1969, Ser. No. 867,511
Claims priority, application Germany, Oct. 26, 1968, P 18 05 483.6
Int. Cl. A61c *11/00*
U.S. Cl. 32—22 7 Claims

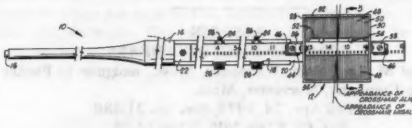
A dental treatment unit comprises a housing, a dental hand appliance support arm connected to the housing for pivotal arcuate movement in a substantially horizontal plane relatively to the housing and a counterbalanced dental instrument tray support arm assembly which is connected to the hand appliance support arm for pivotal arcuate movement therewith.



3,650,034
METHOD AND APPARATUS FOR OPTICAL ALIGNMENT

Robert A. Ruckle, and George E. Shepard, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed May 29, 1969, Ser. No. 828,911
Int. Cl. G01c *15/12*
U.S. Cl. 33—46 R 3 Claims



A method and apparatus for establishing a line of measurement normal to an optical line of sight, the apparatus including a linear scale and a viewing box adjustably connected to the scale. The viewing box has two sides which diverge from each other in extending outwardly from a planar surface of the linear scale which carries measuring indicia. These sides each carry a series of parallel lines. In the method of the invention, an optical line of sight is established by the use of bench marks and a sighting instrument having a sighting crosshair. One end of the linear scale is then placed against a reference point on structure to be optically aligned, and the viewing box is moved along the scale until the line of sight passes through the viewing box. The scale and box are then pivoted about the reference point in a precise level plane until the parallel lines of the viewing box extend parallel to the crosshair. In this status, the linear scale extends at a right angle to the line of sight.

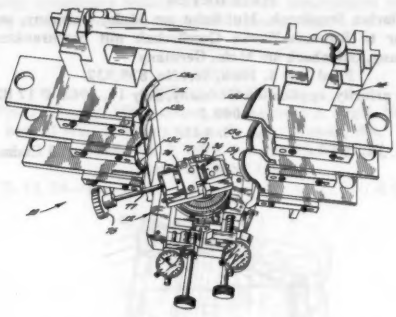
3,650,035
FORM GAGE LEAN ADAPTER

Charles L. Mueller, Harrisburg, Pa., assignor to TRW-Inc., Cleveland, Ohio

Filed July 22, 1969, Ser. No. 843,666
Int. Cl. G01b *5/20*
U.S. Cl. 33—174 PB 19 Claims

A turbine or compressor blade is held in an adapter for a guillotine gage for checking lean in any direction. The adapter includes a plurality of cylindrical forms which are slidingly intercoupled with keys and keyways on adjacent faces to permit relative movement along an X and a Y axis

within the confines of a gap generated with respect to the stacking axis of the airfoil under test. The adapter is provided with a series of indicia markings equally spaced at 2° 30′ so that the adapter generates the aforementioned circle when adjusted to a predetermined lean tolerance. The gap is



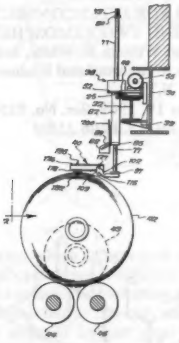
formed by parallel conically shaped surfaces, one of these surfaces on one of the cylindrical forms and the other on the inside of a threaded adjusting ring. The ring carries the indicia for which each of the markings of 2° 30′ is equal to 0.001 tolerance. Tolerance may therefore be directly set by appropriate adjustment of the ring.

3,650,036

APPARATUS FOR DETECTING SURFACE VARIATIONS

Donald B. Coveney, Ottawa, Ontario, and Ronald J. Ouellette, Gatineau, Quebec, both of Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Filed Nov. 6, 1969, Ser. No. 874,647
Claims priority, application Canada, July 11, 1969, 056778
Int. Cl. G01b *5/20, 7/24, 7/28*
U.S. Cl. 33—174 P **21 Claims**



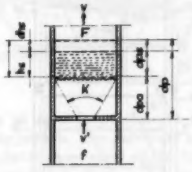
An apparatus for detecting surface variations in large paper rolls in which a sensing mechanism is suspended from an overhead beam and is vertically and angularly movable into engagement with the roll surface, where it is held in place by gravity. The sensing mechanism includes an elongated reference arm and a sensing arm pivotally connected to the reference arm. A spherical contact element on the sensing arm rests on the roll such that there is only a single point of contact between the sensing mechanism and the roll. Upon horizontal movement of the sensing mechanism in a direction parallel to the axis of the roll, the sensing arm pivots relative to the reference arm in response to depressions or bulges in the roll surface. This pivotal movement is detected by a transducer which controls a recorder to provide a continuous visual indication of the surface contour of the roll.

3,650,037

METHOD AND APPARATUS ASSURING THE STEADY FLOW OF TREATMENT GAS THROUGH A MIXTURE OF BULK MATERIALS

Hans Oetiker, St. Gall, Switzerland, assignor to Gebruder Buhler AG, St. Gall, Switzerland

Filed Mar. 31, 1970, Ser. No. 34,753
Claims priority, application Switzerland, Mar. 31, 1969, 4832/69
Int. Cl. F26b *3/08*
U.S. Cl. 34—10 **12 Claims**



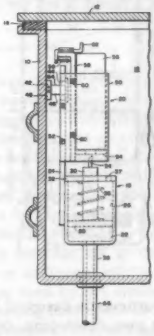
A method for assuring a steady flow of treatment gas through a mixture of bulk materials flowing, in a dense, homogeneous fluidized bed layer of varying height, over a porous, gas-permeable material support, comprises providing a screen-like porous gas-permeable mat as part of the support and carrying the bulk materials, and providing a perforated plate in spaced relation beneath the mat and covered by the treatment gas. The treatment gas, in addition to the effect thereon exerted by the porous mat and the fluidized layer, is subjected to a velocity variation caused by the diaphragm effect of the flow-through area of the perforated plate. The velocity of the gas is controlled within a range assuring maintenance of a dense, homogeneous fluidized bed layer. The diaphragm effect is selected, within the velocity range, at a value inversely proportional to the square root value of the specific surface load of the maximum admissible bulk material layer acting on the material support.

3,650,038

ARTICLE TREATING APPARATUS

Patrick A. Alessi, Needham, and Joel W. Jansky, Jamaica Plain, both of Mass., assignors to Advanced Instruments, Inc., Watertown, Mass.

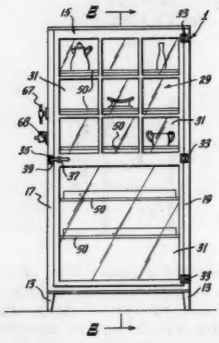
Filed Oct. 16, 1969, Ser. No. 867,008
Int. Cl. A61l *3/00*
U.S. Cl. 34—45 **10 Claims**



Apparatus for sterilizing articles including means to release gaseous sterilant from cartridge held within the sterilizing

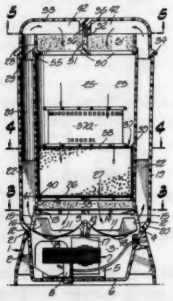
chamber, said means actuated by pressure sensing means so as to release the sterilant only after a required degree of vacuum has been attained. May also include time-limit alarm means for the vacuum pulling stage and the sterilant releasing stage.

3,650,039
SILVERWARE CABINET
Joseph J. Harding, 204 Tarrytown Drive, Richmond, Va.
Filed Jan. 13, 1970, Ser. No. 2,495
Int. Cl. F26b *21/14*
U.S. Cl. 34—45 **7 Claims**



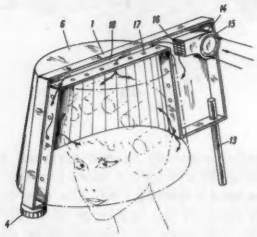
Oxygen is removed from the interior of a housing or chamber adapted to contain silverware so that the silverware will not oxidize or tarnish due to oxidation. The oxygen may be removed from the silverware housing by means, for example, of an oxygen consuming flame burning within the housing, by purging the interior of the housing with a non-oxidizing gas so as to provide therein a non-oxidizing atmosphere, or by evacuating the housing and replacing the evacuated atmosphere with a non-oxidizing gas.

3,650,040
FILM DRYER
Louis D. Statham, and Walter H. Eisele, both of 2230 Statham Boulevard, Oxnard, Calif.
Filed Aug. 28, 1969, Ser. No. 853,750
Int. Cl. F26b *21/06*
U.S. Cl. 34—80 **9 Claims**



A dryer assembly particularly designed for use by photographers who do their own developing, comprising a closed system isolated from the ambient environment, containing a desiccant space and an article-containing space suitable to receive film strips, and means to circulate the air in closed cycles through the article space, and desiccant contained in said desiccant space.

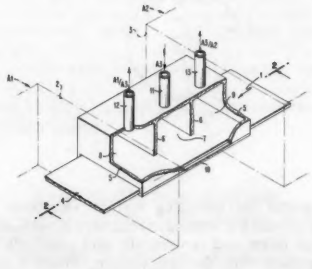
3,650,041
HAIR DRYER
Gotz Florian Strzelczyk, Muhlheim am Main, Germany, assignor to Rowenta-Werke Gesellschaft mit beschrankter Haftung, Offenbach am Main, Germany
Filed July 8, 1969, Ser. No. 839,932
Claims priority, application Germany, July 11, 1968, P 17 82 040.5
Int. Cl. A45d
U.S. Cl. 34—99 **3 Claims**



A hair dryer of the hood type wherein the hood or bonnet is collapsible into such a position after use so as to take up a minimal of storage space.

The bonnet is constructed of both stiff and flexible parts arranged on either side of a thin substantially rectangular casing. When the bonnet is used the parts fold outwardly from either side of the case forming a full sized hair dryer. When the bonnet is stored the parts are folded inwardly forming a volume similar to a small attache case.

3,650,042
GAS BARRIER FOR INTERCONNECTING AND ISOLATING TWO ATMOSPHERES
Frank E. Boerger, and William H. White, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 19, 1969, Ser. No. 825,777
Int. Cl. F26b *25/00*
U.S. Cl. 34—148 **38 Claims**



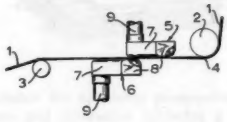
A transition or isolation zone for accommodating continuous free flow of a tier of articles between two distinct and isolated atmospheres. The transition zone includes a series of alternate inlet and outlet compartments for a non-reactive gas wherein the compartments contain inlet and outlet

openings interconnecting with each other and the indicated atmospheres. The cross sections of the openings are complementary to the cross section of the tier of articles to provide a restricted orifice-size clearance therebetween, whereby the orifice phenomena can be employed by correlation of pressures to control the flow of gas and conversely to substantially completely isolate the indicated atmospheres without any measurable cross-migration therebetween.

3,650,043
WEB STABILIZER

Wm. F. Overly, Minneconne, and Kenneth J. Pagel, Neenah, both of Wis., assignors to Overly, Inc., Neenah, Wis.

Filed Apr. 3, 1970, Ser. No. 25,505
Int. Cl. F26b *13/00*
U.S. Cl. 34—156 **6 Claims**

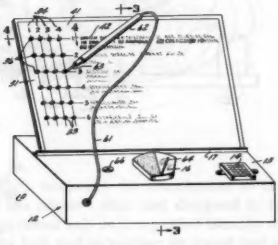


An air foil web stabilizer is constructed with its opposite ends disposed generally at a slight angle to provide a lateral component to the air discharge in the general direction of web movement to thereby remove wrinkles from the web.

3,650,044
TEACHING DEVICE

Donald R. Burdick, Fairfield, Ohio, assignor to Donald H. Pater, Village of Green Hills, Ohio, a part interest

Filed Sept. 22, 1970, Ser. No. 74,404
Int. Cl. G09b *7/06*
U.S. Cl. 35—9 C **6 Claims**



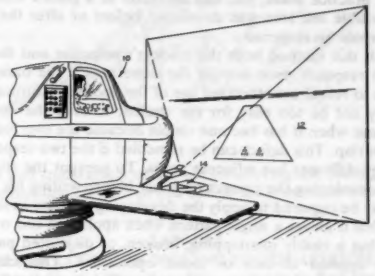
A teaching device which is powered by an exposed light sensitive cell. A galvanometer, a question and answer display, and pupil operated means for indicating a selected answer in the display are connected to the cell, and when a predetermined answer is selected by the pupil and light is being received by the cell, the galvanometer is energized.

3,650,045
PROJECTED VISUAL TRAINING AID

Gerald F. Wood, Vestal, and Paul E. Green, Harpursville, both of N.Y., assignors to Singer-General Precision, Inc., Binghamton, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,255
Int. Cl. B64g *7/00;* **G09b** *9/08*
U.S. Cl. 35—12 N **8 Claims**

Apparatus providing a visual reference to assist in training a student operating a fixed-base aviation trainer in performing runway approaches and landings. The apparatus comprises a plurality of members movable to form cooperatively a two dimensional figure and means for projecting an outline of the figure on a vertically disposed display surface for viewing by the student. The visible outline conforms to a two dimensional projection on a vertical plane of the apparent

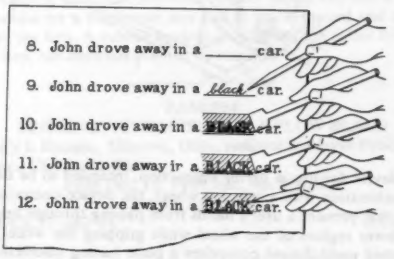


shape of a runway as seen in perspective from an aircraft making a landing approach. The members are moved in accordance with simulated movement of the trainer so that the projected outline properly reflects apparent changes in the trainee's positional viewpoint with respect to the simulated runway.

3,650,046
EDUCATIONAL DEVICE WITH SELF-CHECKING ARRANGEMENT

Burrhus F. Skinner, Cambridge, Mass., assignor to Meredith Corporation

Continuation-in-part of application Ser. No. 638,071, May, 1967, now abandoned , and a continuation-in-part of 815,803, Apr., 1969, now abandoned. This application Nov. 10, 1969, Ser. No. 875,057
Int. Cl. G09b *3/02*
U.S. Cl. 35—91 G **23 Claims**


8. John drove away in a _____ car.
9. John drove away in a black car.
10. John drove away in a BLACK car.
11. John drove away ir a BLACK car.
12. John drove away in a BLACK car.

Educational devices such as workbooks and the like for instructing students include s sheet visibly printed with (a) information or intelligence to which response must be made on the part of the student, and (b) a designated area or series of areas in which the student may give a response or be provided with additional information or "hints" of the correct answer. The student provides a response in the designated area or areas with a first type of writing instrument. The correct answer or further instructions or intelligence for the student are printed in invisible ink in the designated area or areas. The answer or additional information becomes visible upon contact of the area by the student with a developing composition. The writing instrument used by the student with a developing composition. The writing instrument used by the student to write his visible response and the developing composition are both selected so that if the invisible ink is

developed prior to the time that the student writes his own response with the writing instrument, his visible marking will have a different appearance than it does when it is made prior to applying the developing composition. Because the sequence of writing and developing can be readily distinguished, the teacher reviewing the student's test paper, workbook, practice sheet, etc. can ascertain at a glance whether an invisible ink area was developed before or after the student wrote his response.

With this method both the student's response and the invisible response must occupy the same area if the order effect is to reveal unauthorized use of the invisible information. It may not be too easy for the student to read the correct response when it has become visible because the two responses overlap. This defect can be remedied if the two responses occupy different but adjacent areas. To prevent the student from developing the correct response before writing his own, he may be required to apply the developing solution in such a way that it leaves a single pattern when applied in one operation, but a visibly overlapping, broken, or disjointed pattern when applied in two or more operations. This can be achieved by using a patterned stamp, roller, or shading pen.

3,650,047

DEVICE FOR USE IN DRIVING INSTRUCTION

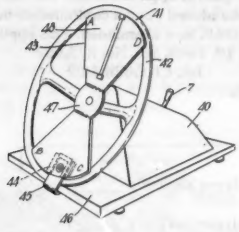
George Dennis Ratcliffe, 43 Northhampton Road, Addiscombe, Croydon, Surrey CRO 7HD, England

Filed Dec. 24, 1969, Ser. No. 888,009

Claims priority, application Great Britain, Dec. 24, 1968, 61,467/68; Jan. 17, 1969 3,000/69

Int. Cl. G09b *9/04*

U.S. Cl. 35—11 **5 Claims**



A device for use in driver instruction, intended to be used in combination with a steering wheel, the device comprising stops that prevent a user's hands from passing through upper and lower regions of the wheel while gripping the wheel. A preferred embodiment comprises a plate having instructions for the use of the device and correct steering printed thereon.

3,650,048

EXPERIMENTING TABLE WITH FLOATING DISCS

Eugene Michaud, 2410 Chemin Ste Foy, Que., Canada

Filed Sept. 21, 1970, Ser. No. 73,864

Int. Cl. G09b *23/10*

U.S. Cl. 35—19 R **17 Claims**

This experimenting device comprises a table, at least one, and preferably two movable plates, such as metallic discs, on the table, means to produce a uniform cushion of air between the table and the plate in order to cause floating of the plate above the surface of the table while having a cushion which is independent of the positions of the plate, and a pulse generator electrically connected with the plate. The plate comprises means to transmit sparks produced by the pulse generator and there are means between the surface of the

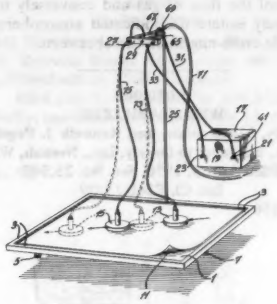


table and the plate or plates to record the sparks when the plate or plates are in movement.

3,650,049

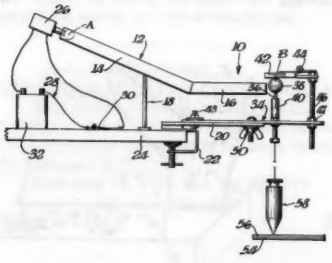
APPARATUS FOR CLASSROOM PHYSICS EXPERIMENTS

Robert F. Chambers, 504 Beverly Road, Newark, Del.

Filed Aug. 13, 1970, Ser. No. 63,466

Int. Cl. G09b *23/10*

U.S. Cl. 35—19 R **9 Claims**



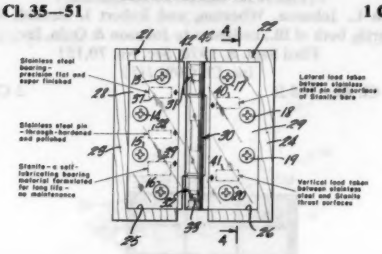
Apparatus for demonstrating Newton's third law of motion comprises first and second substantially spherical masses. Structure is provided for moving first mass along a path of travel that includes substantially horizontal portion. Support structure is provided for locating second mass in alignment with horizontal portion of path of travel of first mass. Support structure includes vertically disposed support pin with flat support surface having area substantially less than diametral cross sectional area of second mass. Sleeve snugly surrounding support pin is mounted for sliding movement relative to pin, and weight is spaced from and directly above flat support surface of support pin for engaging top of second mass when second mass is positioned upon support surface of pin. Sleeve has upper position where upper surface thereof and support surface of pin are close to one another for locating second mass on support surface. Sleeve has lower position spaced from support surface of pin so that second mass is supported by pin between support surface thereof and weight when sleeve is moved to lower position after assisting in locating second mass on support surface.

3,650,050

HINGE EXHIBITOR

Charles R. Suska, Roxbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sept. 29, 1969, Ser. No. 861,706
Int. Cl. G09b 25/02
U.S. Cl. 35—51 1 Claim


Stainless steel bearing – precision flat and spur finished
Stainless steel pin – through-hardened and polished
Stanite – a self-lubricating bearing material formulated for long life – no maintenance
Lateral load taken between stainless steel pin and surface of Stanite bore
Vertical load taken between stainless steel and Stanite thrust surfaces

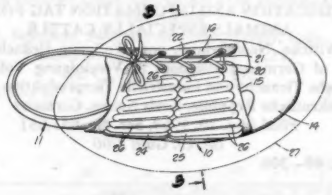
A hinge exhibitor for apprising prospective users of the hinge's structure and operation includes a demonstration hinge mounted to simulate an application of the hinge. Messages appearing on the hinge leaves are explanatory of hinge components that may be seen through transparent hinge knuckles.

3,650,051

PUNTING ACCESSORY FOR FOOTBALL PLAYER'S SHOE

William H. Sass, 5631 Corning Avenue, Los Angeles, Calif.

Filed June 8, 1970, Ser. No. 44,213
Int. Cl. A43b 00/00
U.S. Cl. 36—2.5 AG 11 Claims



A football player's accessory for attachment to the mid-length portion of the player's shoe and designed to spin the ball about its longitudinal axis as it is punted thereby dynamically stabilizing the ball and increasing its range and accuracy. The exterior of the accessory is roughened or otherwise contoured for non-skidding contact with the ball as the punter lofts it to initiate a punt.

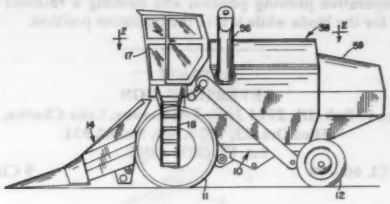
3,650,052

CROP HARVESTING COMBINE

Arved Maiste, and Melvin F. Robertson, both of Brantford, Ontario, Canada, assignors to White Motor Corporation of Canada Limited, Brantford, Ontario, Canada

Filed Feb. 24, 1970, Ser. No. 13,271
Claims priority, application Canada, Feb. 24, 1969, 043,795
Int. Cl. A01d 75/00
U.S. Cl. 56—473.5 3 Claims

A crop harvesting combine which has a vehicle frame structure for supporting and housing threshing, separating and cleaning mechanisms and a built-in grain bin which is incorporated as an integral part of the frame structure with the floor of the bin providing a roof over the compartment in which the threshing cylinder, straw walkers, cleaning pans and associated devices are mounted, and the grain bin having co-operating augers in bottom troughs extending longitudinally and transversely of the bin for moving the clean grain to an unloading elevator at one end of the transverse trough.

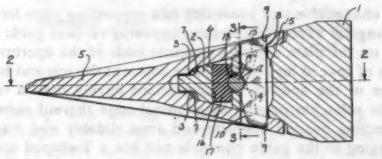


3,650,053

ROLLER LOCK FOR DIGGING TOOTH ASSEMBLY

Josef Baer, South Milwaukee, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Continuation of application Ser. No. 825,124, May 7, 1969, now abandoned. This application Apr. 12, 1971, Ser. No. 133,326
Int. Cl. E02f 9/28; E21c 13/00
U.S. Cl. 37—142 9 Claims



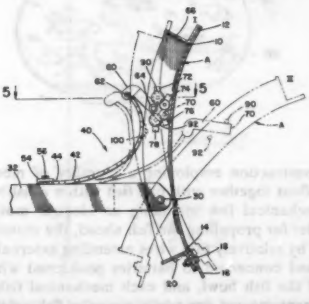
This invention relates to a lock for the key which holds a digging tooth point on an adapter. The lock comprises a roller that is engageable with a recess in the key and is mounted in an open-ended cage so that it cannot move laterally or longitudinally with respect to the key but is free to rotate on a transverse axis and to move toward and away from the key. A rubber backup plug biases the roller toward the key, but does not prevent its rotation.

3,650,054

TRIPPING MECHANISM FOR A PLOW BLADE

Harry I. Hanson, Minerva, Ohio, assignor to Meyer Products, Inc., Cleveland, Ohio

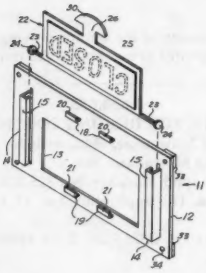
Filed Dec. 11, 1969, Ser. No. 884,125
Int. Cl. A01b 61/04
U.S. Cl. 37—42 VL 8 Claims



A tripping mechanism for a plow blade including an elon-

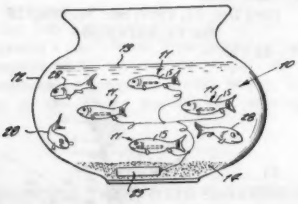
gated, transverse flexure spring extending between the plow blade and its support structure for biasing the plow blade into the operative plowing position and forming a resilient support for the blade while it is in the operative position.

3,650,055
REVERSIBLE SIGN
James P. Bult, III, 2924 Jerry Lee Avenue, Lake Charles, La.
Filed Oct. 23, 1970, Ser. No. 82,931
Int. Cl. G09f *19/02*
U.S. Cl. 40—78 **9 Claims**



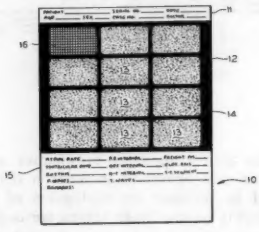
A changeable sign consisting of a supporting plate having a rectangular exposure aperture, opposing vertical guide channels on the plate adjacent opposite ends of the aperture and pairs of spaced lugs on the plate adjacent the top and bottom edges of the aperture. A sign board having indicia on opposite sides has on one longitudinal edge thereof outwardly projecting headed opposite end arms slidably and rotatably engaging in the guide channels and has a T-shaped member projecting from its other longitudinal edge which is supportably engageable between the top pair of spaced lugs to expose one side of the sign board through the aperture. The sign board may be alternatively supported in an inverted position with said other longitudinal edge resting on the bottom lugs, with T-shaped member received therebetween, to expose the other side of the sign board through said aperture.

3,650,056
ANIMATED AQUATIC DISPLAY
Lorraine J. Walton, Route 4, Innisfail, Alberta, Canada
Filed Apr. 20, 1970, Ser. No. 30,124
Int. Cl. G09f *19/02*
U.S. Cl. 40—106.25 **1 Claim**



A construction employing a plurality of mechanical fish which float together with live fish within a fishbowl, each of the mechanical fish including an electric motor driving a propeller for propelling the fish ahead, the motors being connected by relatively thin wires extending externally of the fish body and connected to batteries positioned within the bottom of the fish bowl, and each mechanical fish including a permanent magnet for positioning the fish relative to other adjacent fish of mechanical type, and each mechanical fish further including a weight for positioning it at a preset elevation within the water.

3,650,057
PRINTED MOUNTING SHEET
Ralph L. Johnson, Wheaton, and Robert I. Henkel, Kenilworth, both of Ill., assignors to Johnson & Quin, Inc.
Filed Sept. 8, 1970, Ser. No. 70,151
Int. Cl. G09f *1/10*
U.S. Cl. 40—158 R **3 Claims**



A mounting card with plural pressure sensitive areas for mounting electrocardiograph diagrams and the like. The card uses a superimposed layer of pressure sensitive adhesive and defined mounting areas through use of an ink imprinted layer defining nonadhesive border areas around the mounting space areas.

3,650,058
IDENTIFICATION AND INFORMATION TAG FOR FARM ANIMALS ESPECIALLY CATTLE
Egon Wittcke, Neufahrland, and Wolfgang Heitsch, Paretz, both of Germany, assignors to Vereinigung Volkseigener Betriebe Tienucht und industrielle Tierproduktion Deutsche Demokratische Republic, Kreis Nauen, Germany
Filed Aug. 20, 1969, Ser. No. 851,651
Int. Cl. G09f *3/00*
U.S. Cl. 40—300 **4 Claims**

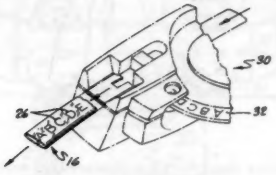
An identification tag, affixed to a neck strap or a skin fold of a cow or other farm animal, carries fixed symbols relating to invariable or rarely variable data such as pedigree and ownership, removable markers signifying recurrent events such as gestation, insemination or lactation, and a rotatable and indexable disk bearing indicia pertaining to frequently changing conditions or requirements (e.g., prescribed rate of feeding) selectively viewable through a cutout in the tag body.

3,650,059

EMBOSSED TUBULAR LABEL FOR IDENTIFYING WIRES AND THE LIKE

Peter E. Johnson, Martinez, Calif., assignor to Dymo Industries, Inc., Berkeley, Calif.

Filed Sept. 5, 1969, Ser. No. 862,610
Int. Cl. G09f 3/00
U.S. Cl. 40—316 5 Claims



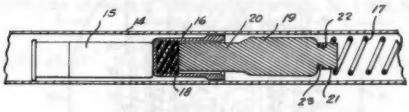
A marking device or label for identifying wires, conduits or the like. The label is made from a flattened tube of a suitable plastic material, preferably one that exhibits stress-whitening characteristics, passed through an embossing tool, such as a hand operated tool which produces on the spot labels so that desired indicia may be embossed thereon, and the embossed material is then returned to its open tubular shape, thereby permitting the same to be telescopically passed over a wire, cable or conduit as a means of identification. Alternatively, the embossed tube may be telescopically inserted over a flexible strap or wire and the strap may then be used to tie the label over an object having a large diameter.

3,650,060

INERTIAL RECOIL REDUCER FOR MAGAZINE FIREARMS

Donald R. Schubert, 3407 4th St. Road, Greely, Colo.

Filed Mar. 13, 1970, Ser. No. 19,227
Int. Cl. F41c 27/00, 25/08
U.S. Cl. 42—1 R 3 Claims



An inertial recoil reducer for magazine firearms which includes a weighted piston interposed between a cushioned magazine follower and the magazine spring. The weighted piston is normally balanced in the magazine and as recoil starts the gun rearwardly, the inertia of the weighted piston causes it to remain in the same position applying pressure to the magazine spring and through it to the magazine and hence to the gun to reduce the recoil of the gun.

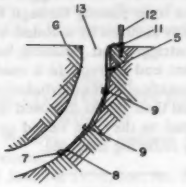
3,650,061

TRAP FOR GOPHERS AND THE LIKE

Lole C. Craft, Jr., 2430 Amelia Street, Shreveport, La.

Filed July 16, 1970, Ser. No. 55,402
Int. Cl. A01m 23/00
U.S. Cl. 43—77 6 Claims

This is a trap for eradicating gophers in the form of a chain having a pair of spaced treble fish hooks secured longitudinally to the aforesaid chain in a manner that will prevent the hooks from rotating. The lower end of the chain is provided with a lead fish sinker while the upper end of the same chain is formed into a loop by which the eradicator is



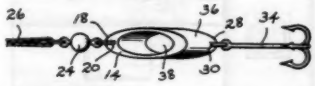
secured when placed in position for use in a gopher hole in the ground.

3,650,062

FISHING LURE

Milo C. Troyer, Route 3, Albion, Ind.

Continuation-in-part of application Ser. No. 679,849, Nov. 1, 1967, now abandoned. This application Dec. 22, 1969, Ser. No. 886,896
Int. Cl. A01k 85/00
U.S. Cl. 43—42.06 18 Claims



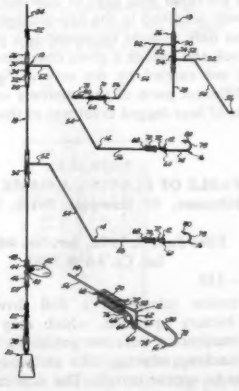
A fishing lure having a tubular body with a bore therethrough. The tubular body has a transverse end face extending obliquely to the axis of the body and defining a water-reaction surface which materially influences the fish-alluring movement of the lure as it is pulled through the water.

3,650,063

OUTRIGGER FISHING DEVICE WITH QUICK-DETACHABLE HOOK COUPLING

Irving L. Pierce, 11363 Garfield, and Harold E. Schenavar, 18696 Inkster Road, both of Detroit, Mich.

Filed Sept. 21, 1970, Ser. No. 73,808
Int. Cl. A01k 91/04
U.S. Cl. 43—42.74 10 Claims



Pivotally mounted between fixed stops on a drop wire or leader weighted at its lower end with a sinker is the coiled-

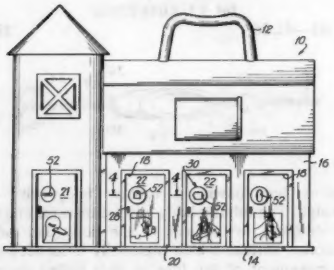
wire hub of an approximately Z-shaped spring wire outrigger. The laterally-bent eye of a horizontal fish hook is quick-detachably interlocked with the laterally-offset V-shaped loop on the outer end of this outrigger with the reversely-bent portion of the loop passing through the eye of the fish hook and detachably secured by a coiled-wire sleeve slidably mounted on the outrigger and yieldably held in place of the laterally-bent detent end thereof. In a modification, arms of the outrigger automatically counterbalance one another for easier swinging, and their hooks disposed in horizontal planes tend to be deflected as they are raised or lowered past obstructions, thereby reducing snagging.

3,650,064

TOY SIMULATING LIVING CREATURES AND AN ENCLOSURE THEREFOR

Franc C. Fusco, Monroe, N.Y., assignor to Louis Marx & Co., Inc.

Filed May 24, 1971, Ser. No. 146,335
Int. Cl. A63h *33/00*
U.S. Cl. 46—12 **10 Claims**



A toy which includes a plurality of FIGS. simulating living creatures and an enclosure simulating a house for these creatures. The figures which simulate the living creatures may represent different animals, birds and the like. The enclosure, which may simulate a barn, for example, has a plurality of door-simulating bodies movable between open and closed positions, and these bodies respectively carry locks provided with key-receiving portions of different configurations. The several figures which represent the various creatures are respectively provided with keys of different configurations to be respectively received in the key-receiving portions of the locks, so that only a figure representing a given creature will be able to lock and unlock a given door-simulating body. The keys which are carried by the several figures are characteristic of different parts of the anatomy of the figures such as the snouts of four-legged creatures or the bills of birds.

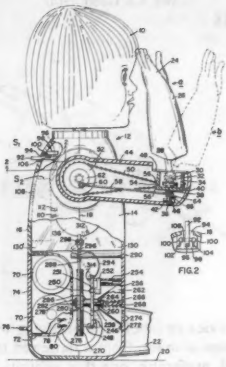
3,650,065

DOLL CAPABLE OF PLAYING A GAME WITH A CHILD

Frank T. Johmann, 49 Hampton Drive, Berkeley Heights, N.J.

Filed June 8, 1970, Ser. No. 44,065
Int. Cl. A63h *5/00*
U.S. Cl. 46—118 **8 Claims**

This invention relates to a doll driven by a motor, preferably battery operated, which may move its hands through a number of different positions. The doll may include a sound-reproducing unit and may also move her mouth so as to appear to talk. The doll may also move her head or eyes. Dolls of the invention can be made in varying degrees of complexity to include all or part of any of the preceding activities. Dolls of the invention can be made which can actively participate with a child in playing games



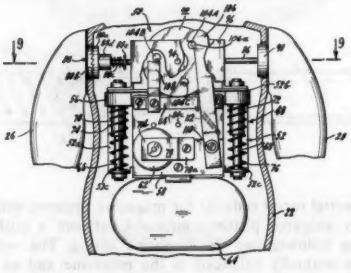
such as "Patty-cake," "Simon says," or other similar games involving movement of arms and hands.

3,650,066

ANIMATED TOY

Francis Robert Amici, Northford, and Robert E. Davis, N. Branford, both of Conn., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,562
Int. Cl. A63h *13/02*
U.S. Cl. 46—129 **13 Claims**



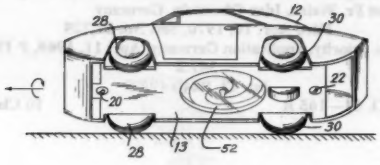
An animated toy in the form of a movable figure which is adapted to stand freely on a support and jump relative thereto which includes a body and depending legs terminating in feet adapted to rest on the support and opposed arms journaled on the body for rotation through a rope-turning cycle and carrying a simulated jump rope. Powered animating mechanisms are provided in the figure for causing the figure to jump relative to the support in a free-standing position and for turning the arms in timed relation to the jumping of the figure such that the jump rope will pass beneath the feet of the figure when they are raised relative to the support such that the figure will simulate a child jumping rope.

3,650,067

GYROSCOPE TOY

Donald Greenwood, Akron, Iowa, assignor to G-L-J Toy Co., Inc., New York, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,157
Int. Cl. A63h 29/20
U.S. Cl. 46—206 11 Claims



Friction driven toys including a gyroscopic stabilizing element.

3,650,068

PROCESS FOR GROWING ALGAE

Colette Meyer, Paris, and Michel Rebeller, L'Etang La Ville, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed June 26, 1969, Ser. No. 836,937
Claims priority, application France, July 5, 1968, 158,222
Int. Cl. A01g 7/00
U.S. Cl. 47—1.4 9 Claims

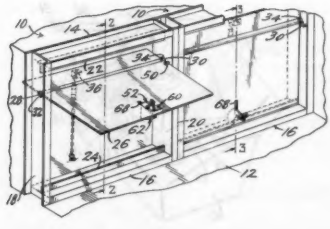
In the open air cultivation of algae, natural brackish water is employed as make-up water instead of softened water. The culture medium is discharged at a rate sufficient to maintain the saline concentration therein at a predetermined concentration compatible with the growth of the algae. The make-up water must have a saline concentration lower than that of the culture medium, preferably at least 10 percent lower.

3,650,069

FIRE DAMPER BLADE LATCH

Raymond L. Alley, Toledo, Ohio, assignor to American Warming & Ventilating, Inc., Toledo, Ohio

Continuation-in-part of application Ser. No. 30,225, Apr. 20, 1970, now abandoned. This application Aug. 31, 1970, Ser. No. 61,268
Int. Cl. E05f 15/20
U.S. Cl. 49—7 3 Claims



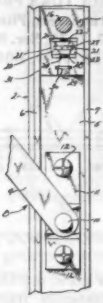
A pivotally mounted latch for a fire damper blade which is mounted to swing on a horizontal axis between an open position and a closed position. The damper is adapted to be mounted across either a horizontal or a vertical duct. The blade is normally held open by a fire responsive release and is weighted to swing by gravity to closed position across the duct when released. The latch is mounted on the outer side of the blade on a pivot axis parallel to that of the blade and extends through a slot in the blade. The latch has a plate with a generally arcuate edge which is eccentric to its pivot and which strikes a catch as the blade closes. The eccentricity of the latch plate weighs the plate to swing it into locked position behind the catch when the damper blade reaches closed position. The latch operates effectively whether the fire damper is mounted in a horizontal or a vertical position.

3,650,070

FRICTION SHOE CONSTRUCTION FOR A PIVOTING WINDOW

John Ringle, III, Wausau, Wis., assignor to Wausau Metals Corporation, Wausau, Wis.

Filed Jan. 26, 1970, Ser. No. 5,865
Int. Cl. E05d 15/44
U.S. Cl. 49—251 4 Claims



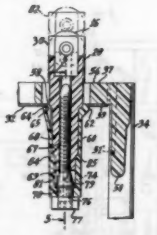
A friction shoe construction for a pivoting type window or closure. The window includes a sash which is mounted for pivoting movement with respect to the frame. The central portions of the sash stiles are pivotally connected to the jambs of the frame by arms, while the ends of the sash stiles are pivotally connected to shoes which ride in guide tracks on the frame jambs. Each shoe is constructed of a flexible material and is provided with a central opening having converging side walls. A wedge block having complementary inclined sides is mounted within the opening. A stud is connected to the wedge block and by tightening down the stud, the wedge block is moved within the opening in the shoe to force the sides of the shoe outwardly into engagement with the guide track to increase the frictional resistance.

3,650,071

PANEL FRAME ASSEMBLY

Homer C. Tanner, Jacksonville, Fla., assignor to Southeastern Aluminum Products, Inc., Jacksonville, Fla.

Filed Sept. 8, 1970, Ser. No. 70,383
Int. Cl. E05d 13/00
U.S. Cl. 49—411 30 Claims



A stile and rail forming a corner, are connected by a unitary corner connector having a first upright portion disposed in a channel of the stile, a laterally extending portion, and a second upright portion spaced from and extending in the same direction as the first upright portion and disposed in an

opening in the rail spaced laterally from the stile. The first upright portion includes a shoulder and the channel includes a shoulder, with the shoulders being in engagement to lock the corner connector to the stile. The second upright portion includes a shoulder engaging a shoulder defining the rail opening to lock the corner to the rail. When the connector is an upper connector a member is adjustably connected to the second upright portion which suspends the connector to an upper track. When the connector is a lower connector, an elongated guide element is slidably connected to the second upright portion which guides the connector on a lower track. Other details to the corner connector guide element, and adjustable member are embodied herein.

3,650,072

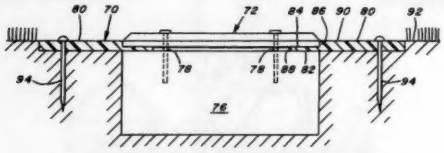
GRAVE MARKING STRUCTURE PROTECTIVE DEVICES

Joseph J. Matvey, 208 Orin Street, Pittsburgh, Pa.

Filed Apr. 27, 1970, Ser. No. 32,198

Int. Cl. E02d *27/50*; **E04h** *13/00*

U.S. Cl. 52—102 **6 Claims**



A protective device for grave marking structures including a unitary generally rectangular frame member having a generally rectangular inner opening. The frame member has two pairs of opposed substantially straight generally parallel sides. Each side is of substantially equal transverse width. Each side has an outer transverse section having a generally uniform thickness and an inner transverse section having an average thickness which is substantially less than the thickness of the outer transverse section. The outer transverse section having a greater transverse width than the inner transverse section. The outer transverse section may have a width of about 1½ to 6 times the transverse width of the inner transverse section. The outer transverse section has a thickness of about 1½ to 11 times the average thickness of the inner transverse section.

3,650,073

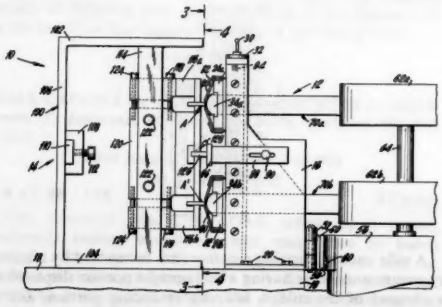
ICESKATE BLADE SHARPENING MACHINE AND METHOD OF USING SAID MACHINE FOR SHARPENING ICESKATE BLADES

Charles Weisman, 125 North Montgomery Street, Valley Stream, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,584

Int. Cl. B24b *21/16*

U.S. Cl. 51—141 **30 Claims**



A pair of iceskate blades are aligned with a templet in a jig. The templet is brought to bear against a rigid fence that is mounted on a structure that includes adjustably positioned endless abrasive belts that are arranged to contact and abrade the bottom surface of the iceskate blades.

3,650,074

METHODS AND APPARATUS FOR CUTTING, GRINDING AND POLISHING SINGLE-CRYSTAL WORKPIECES

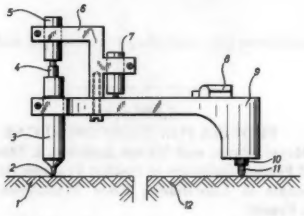
Ernst August Weinz, Idar-Oberstein, Germany, assignor to Ernst Fr. Weinz, Idar-Oberstein, Germany

Filed Apr. 10, 1970, Ser. No. 27,229

Claims priority, application Germany, Apr. 11, 1969, P 19 18 347.2

Int. Cl. B24b *49/00*

U.S. Cl. 51—165 R **10 Claims**



Mechanical vibrations generated during the cutting, grinding and polishing of single-crystal material, such as diamonds, are converted into electrical signals by a transducer; amplified; and used to control the rotation of the workpiece holder. The control is such that the single-crystal material is oriented along its "easy" axis, for ease of cutting, etc.

3,650,075

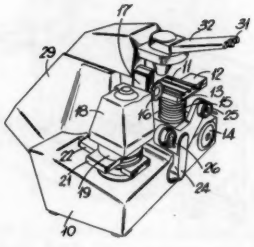
OPTICAL PROFILE GRINDERS

Peter Alan Mason, Kenilworth, England, assignor to Wickman Machine Tool Sales Limited, Banner Lane, Tile Hill Coventry, Warwickshire, England

Filed Feb. 10, 1970, Ser. No. 10,196

Int. Cl. B24b *49/12*

U.S. Cl. 51—165.72 **12 Claims**



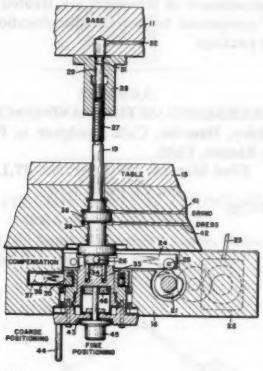
An optical profile grinding machine comprising a workpiece support, a grinding wheel support and means for producing relative movement between the grinding wheel and a workpiece, a platform supporting an enlarged layout of a profile to be reproduced on the workpiece, a microscope for viewing the layout through a reducing lens and the grinding wheel in superimposed relationship so that an operator can reproduce the profile on the workpiece.

3,650,076

GRINDING MACHINE

Herbert R. Uhtenwoldt, Worcester; William H. Grotewold, Holden, and Bruno E. Straub, Worcester, all of Mass., assignors to The Heald Machine Company, Worcester, Mass.

Filed Apr. 15, 1970, Ser. No. 28,716
Int. Cl. B24b 49/00
U.S. Cl. 51—165.89 10 Claims



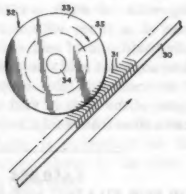
This invention relates to a grinding machine and, more particularly, to apparatus for bringing about various cross-feed motions in a machine for finishing workpieces by the abrasive process.

3,650,077

METHOD FOR GRINDING THE SIDES OF THE TEETH OF FLEXIBLE CARD CLOTHING ON A CARD ENGINE

John D. Hollingsworth, P.O. Box 516, Greenville, S.C.

Continuation-in-part of application Ser. No. 739,131, June 21, 1968, now abandoned. This application Oct. 27, 1970, Ser. No. 84,449
Int. Cl. B24b 1/00
U.S. Cl. 51—327 1 Claim



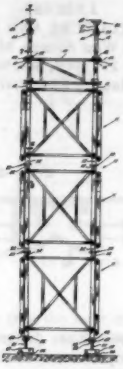
Method for grinding the sides of the teeth of flexible card clothing by continuously grinding the sides of the teeth along the full width of said card engine. The grinder comprises a rotatable shaft on which is mounted a plurality of spaced apart abrasive discs along the entire length of the shaft. The grinder extends the entire width of the card engine and while rotating about the axis of the shaft also reciprocates in the direction of the axis to grind the sides of the teeth along the full width of the card engine.

3,650,078

SHORE TOWER ASSEMBLY

Ralph L. Jennings, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

Filed Sept. 15, 1970, Ser. No. 72,385
Int. Cl. E04g 5/02; E04h 12/10
U.S. Cl. 52—122 10 Claims



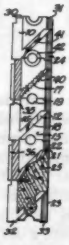
The tower assembly is used in construction work for supporting a load such as girders or concrete form assemblies at varying elevated positions above the ground surface during the building of highway bridge structures and the like and comprises a series of vertically stacked tower sections. Each tower section has four corner posts which in adjacent tower sections are releasably connected together in an end to end relation to provide a desired tower height. The corner posts on the top and bottom tower sections have independently linearly adjustable extension units to accommodate, respectively, varying load engageable surfaces and an uneven ground surface. A frame structure is connectable to each adjacent pair of corner posts in a tower section at selected positions longitudinally thereof to vary the spacing between adjacent pairs of corner posts in accordance with the dimensional requirements of the load to be supported by the tower assembly.

3,650,079

BUILDING BLOCK AND WALL CONSTRUCTION WITH GROUT-RECEIVING LATERAL CELLS

Edward H. Lubin, 10941 Strathmore, Apt. 56, Los Angeles, Calif.

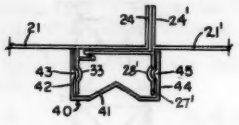
Filed Jan. 14, 1970, Ser. No. 2,788
Int. Cl. E04b 2/32; E04c 1/10
U.S. Cl. 52—316 10 Claims



An inclined pocket web extending longitudinally in upwardly diverging relation to a back wall of a building block, cooperates therewith to define one or more grout-receiving cells which are open at the front side of the block, each cell

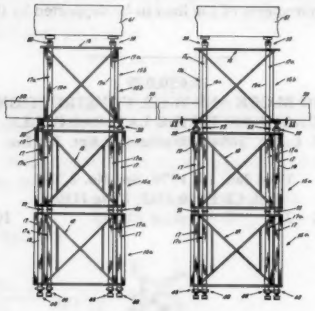
having its bottom area in the form of a pocket below the level of the front edge of the web. In a building wall embodying superimposed courses of the blocks, the open fronts present a plurality of acute edges of the pocket webs which function as screeding guides for accurately developing a flat planar face on the grout filling the cells.

3,650,080
PANEL STRUCTURE AND ASSEMBLY
Frank J. Leale, Sr., 52 West Avenue, Malverne, N.Y.
Filed Sept. 19, 1969, Ser. No. 859,301
Int. Cl. E04c *2/40*
U.S. Cl. 52—469 **7 Claims**



The edges of wall panels are designed to interlock when placed side by side. Projections upon the panels cooperate to hold either a spline, a bridging batten, or both. The unique edge structure consequently provides for concealment of the devices which fasten the panel to the wall and permit the addition of splines or bridging battens as decorative and architectural features.

3,650,081
SHORE TOWER ASSEMBLY
Lyde S. McCracken, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa
Filed Sept. 17, 1970, Ser. No. 73,145
Int. Cl. E04h *12/10*
U.S. Cl. 52—637 **6 Claims**

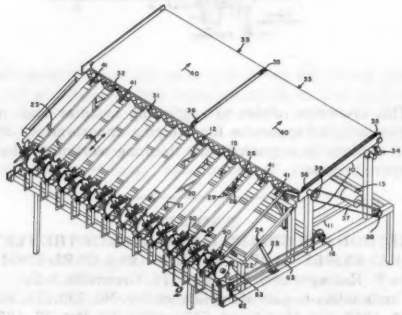


The tower assembly is comprised of vertically stacked tower sections each of which includes a pair of primary frame structures having end posts and interconnected by frame units in a variable spaced parallel relation so that the end posts constitute corner posts for the tower assembly. A pair of secondary frame structures corresponding to the primary frame structures may be connected to the frame units in a parallel relation adjacent a corresponding primary frame structure, or only one of such secondary frame structures can be so assembled relative to its corresponding primary frame structure. Additionally, the primary and secondary frame structures can be relatively extended upwardly of the tower assembly to support separate loads at varying levels.

3,650,082
METHOD OF TREATING PACKAGING MATERIALS TO PREVENT DISCOLORATION
Homer Virgil Meek, deceased, late of Wyoming, Ohio (by Katherine L. Meek, executrix), assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of application Ser. No. 734,197, June 4, 1968, now abandoned. This application Dec. 29, 1969, Ser. No. 888,903
Int. Cl. D21h *5/22, 1/10*
U.S. Cl. 53—5 **7 Claims**

A method of treating packaging materials is disclosed wherein cartonboard or wrappers are treated with a boron-containing compound to prevent discoloration by the contents of the package.

3,650,083
PACKAGING METHOD AND MACHINE
Lloyd D. Riley, Danville, Calif., assignor to Filper Corporation, San Ramon, Calif.
Filed May 14, 1970, Ser. No. 37,131
Int. Cl. B65b *5/10*
U.S. Cl. 53—35 **10 Claims**

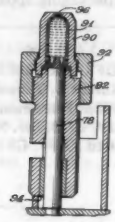


A machine having a row of article supports for supporting a plural succession of corresponding columns or files of articles on said supports in which a leading article at one of the corresponding ends of each succession is positioned for discharge, one at a time, with a container on a support therefor passing said one of said ends, and an article releasing mechanism adjacent said one end of each succession actuatable by movement of the support for each container passing said one of the ends of said successions for releasing articles, one at a time from said one of said ends.

3,650,084
METHOD FOR FILLING AND SEALING PLASTIC AMPOULES
Stephen T. Moreland, Grosse Pointe Woods, Mich., assignor to R. P. Scherer Corporation
Original application Jan. 15, 1968, Ser. No. 697,891, now Patent No. 3,540,444. Divided and this application Jan. 22, 1970, Ser. No. 4,884
Int. Cl. B65b *7/28*
U.S. Cl. 53—37 **1 Claim**

An ampoule for a hypodermic jet injector. The end of the ampoule, through which medicament passes, is constructed of a resilient material. Cross-cuts are scribed in the resilient end so that a plunger driving a plug into the opposite end of

the ampoule forces medicament through the cross-cut end by bursting it along lines coincident with the cuts. Alternate end



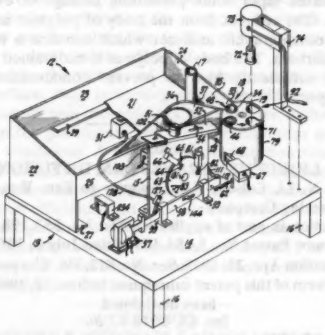
cuts, a storage case, and methods for filling the ampoules are also disclosed.

3,650,085

AUTOMATIC COIN SORTING, COUNTING AND WRAPPING MACHINE

Harry C. Bay, 1108 South Arlington Avenue, Reno, Nev.

Filed Feb. 16, 1970, Ser. No. 11,487
Int. Cl. B65b *57/20*
U.S. Cl. 53—59 **5 Claims**



Coins dropped into a hopper are directed one by one down a chute and into a coin wrapping tube located on a turntable. The tube is in vertical attitude and is open at its upper end to receive the coins. When a predetermined number of coins has been loaded in the tube, the machine is programmed to advance the turntable so that the coin-filled wrapper is moved to the next station and is there acted upon by a crimping die to close the open end of the tube. At the next advance, the coin-filled and closed tube progresses to a discharge station where it is ejected from the machine. In the meantime, an empty tube is deposited on the turntable preparatory to being moved ahead to the coin loading station, thereby completing the cycle.

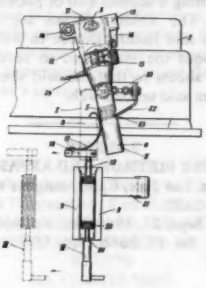
3,650,086

COIN WRAPPING MACHINES

Werner Puhahn, Philippsburg, and Rolf Lampert, Bauschlott, both of Germany, assignors to Standardwerk Eugen, Reis, GmbH, Bruchsal, Germany

Filed Aug. 6, 1970, Ser. No. 61,757
Claims priority, application Germany, Aug. 8, 1969, P 19 40 389.5
Int. Cl. B65b *57/20, 11/04*
U.S. Cl. 53—59 **9 Claims**

Apparatus for feeding money coins from a supply source to a stacking means comprising a delivery tube having a funnel at one end. The funnel is pivotally secured adjacent to the source of supply so that the tube is swingable in an arc between a first position, in alignment between the supply and the stacking unit and a second position out of alignment therewith. Means are provided interconnecting the tube with



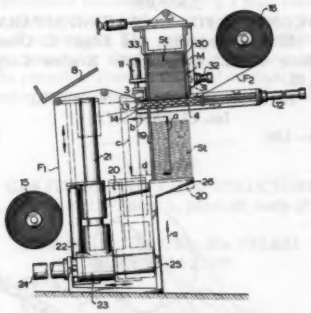
the grasping means so that the tube is moved into the first position when the grasping means transports a preceding column of coins from the stacking unit and into the second position when the grasping means is returned into alignment with the stacking means.

3,650,087

APPARATUS FOR COMPRESSING AND PACKAGING A STACK OF FLATTENED BAGS OR THE LIKE

Friedhelm Brinkmeier, Ladbergen, and Hermann Rocker, Hulben via Urach, Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed July 28, 1970, Ser. No. 58,763
Claims priority, application Germany, July 28, 1970, P 19 39 069.3
Int. Cl. B65b *63/02*
U.S. Cl. 53—124 C **7 Claims**



An apparatus for compressing and packing a stack of flattened bags or the like that comprises a compression chamber for receiving the stack, an opening in said chamber through which the said stack can be inserted, a plunger for introducing the stack in said chamber and compressing it against a backing member of the said chamber, two freely rotatable supply rolls of thermoplastic sheets disposed on opposite sides of said opening and welding means for interconnecting said sheets by a transverse weld seam to form a web of packaging material. The web is disposed across said opening to be carried into the chamber by the stack when said stack is introduced. Means are provided for displacing said plunger at right angles to said weld seam after its compression stroke.

A transversely movable folding device is disposed at the same level as the plunger at the end of its compression stroke. The folding device is effective to maintain compression of the stack after the plunger has been displaced; to close the web about the stack to define a packaging sleeve for said stack from said web; and to bring the sheets of said web together in readiness for forming a second web of packaging material for a second stack. The welding means are also effective in cooperation with said folding device to weld the packaging sleeve closed about the stack and to sever the packaging sleeve from said sheets so that the said sheets remain interconnected to form said second web.

3,650,088

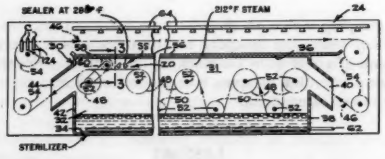
SEALING METHOD AND APPARATUS

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 23, 1969, Ser. No. 860,335

Int. Cl. B65b *7/06, 55/06*

U.S. Cl. 53—127 **11 Claims**



A high-dwell, high pressure, and low temperature method and apparatus for sealing heat sealable flexible containers. The flexible containers are sealed before moving out of a sterilizing chamber maintained at a sterilizing temperature of between about 212° and 250° F. Sealing bars are heated to a temperature of between about 250° and 300° F., and are clamped against the container at a pressure above 100 p.s.i., preferably about 250 p.s.i. for a period of between 2 to 6 seconds, preferably about 4 seconds.

3,650,089

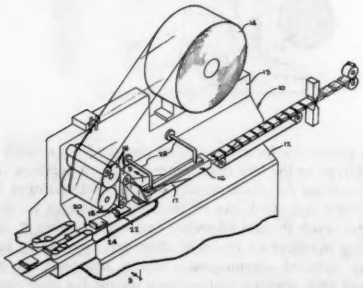
SPEED CONTROL FOR PACKAGING APPARATUS

Roland E. Miller, Orangeville, and Edgar C. Olson, Waukegan, both of Ill., assignors to Kraftco Corporation, Chicago, Ill.

Filed July 30, 1970, Ser. No. 59,593

Int. Cl. B65b *9/12*

U.S. Cl. 53—180 **7 Claims**



An infeed conveyor for a packaging apparatus including a drive mechanism coupled to a power source for advancing articles into the packaging apparatus. The drive mechanism is operable to convert constant speed of the power source to a periodically varying speed of the conveyor to change the spacing of the articles from a first spacing on the conveyor to a second spacing in the packaging apparatus.

3,650,090

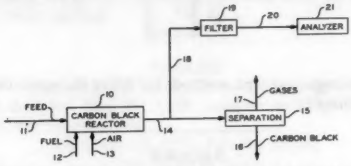
ANALYSIS OF GASEOUS MIXTURES

Harry F. Temple, and Robert L. Thomas, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed June 19, 1970, Ser. No. 47,254

Int. Cl. B01d *53/04;* **G01n** *31/08*

U.S. Cl. 55—31 **6 Claims**



A gaseous mixture containing nitrogen, carbon monoxide, carbon dioxide, hydrogen, water vapor and hydrocarbons is analyzed by injecting a sample of the mixture into a carrier gas. The carrier gas containing the sample is passed through a body of cross-linked organic polymer which retards passage of the water vapor while permitting passage of other constituents. The effluent from the body of polymer is directed to a chromatographic analyzer which contains a molecular sieve adsorbent. The body of polymer is maintained at a temperature sufficiently high to prevent condensation of the water vapor.

3,650,091

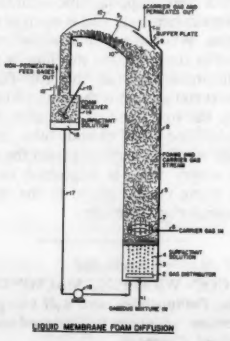
LIQUID MEMBRANE FOAM DIFFUSION

Norman N. Li, Edison, N.J., assignor to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 552,198, May 22, 1966, now Patent No. 3,454,489, dated July 8, 1969. This application Apr. 22, 1969, Ser. No. 818,336. The portion of the term of this patent subsequent to Nov. 12, 1985, has been disclaimed.

Int. Cl. B01d *57/80*

U.S. Cl. 55—83 **14 Claims**



A gaseous mixture is passed through a layer of liquid surfactant membrane; gradually, a foam of bubbles is generated. The bubbles are coated with liquid membrane and have an interior of the gaseous mixture. Component(s) of the mixture permeate more rapidly through the membrane and pass into the foam. To remove the more rapidly permeating com-

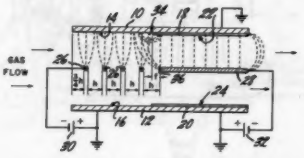
ponents an inert gas is passed through the foam; the inert gas entrains the more rapidly permeating components and serves to transport it out of the system.

3,650,092

ELECTROGASDYNAMIC PRECIPITATOR UTILIZING RETARDING FIELDS

Meredith C. Gourdine, West Orange; Geza Von Voros, Glen Rock, and Ta Kuan Chiang, Berkeley Heights, all of N.J., assignors to Gourdine Systems, Inc., Livingston, N.J.

Filed Aug. 17, 1970, Ser. No. 64,243
Int. Cl. B03c 3/10
U.S. Cl. 55—114 48 Claims



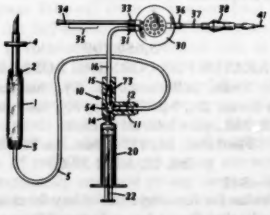
Electrostatic precipitating apparatus in which particles entrained in a gas stream are charged in an ionization zone established between one or more ionizer electrodes and a movable attractor electrode and collected, by reaction with a transverse precipitation field, in an adjacent downstream zone including a movable dielectric collection surface. The dielectric collection surface may be carried by the same conductive member constituting the attractor electrode. Electric fields that are non-attractive to the charged particles, and that have components directed against gas flow, are established in the vicinity of the ionization zone-collection zone interface, thus increasing collection efficiency by retarding downstream movement of the particles, including turbulence in the gas stream, and creating non-linear precipitation field conditions. A series of such collection zones or of additional ionization zones and associated collection zones may be spaced along the gas stream to further enhance precipitation efficiency and to reduce re-entrainment of particles in the gas stream. The ionizer and attractor electrodes and the dielectric collection surfaces are movable to a cleaning zone remote from the gas stream where collected particles are neutralized and removed.

3,650,093

STERILE DISPOSABLE MEDICAMENT ADMINISTRATION SYSTEM

David Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of application Ser. No. 643,093, June 2, 1967, now Patent No. 3,447,479, Continuation-in-part of application Ser. No. 710,609, Mar. 5, 1968, now Patent No. 3,572,375, Continuation-in-part of application Ser. No. 718,088, Apr. 2, 1968, now Patent No. 3,523,408, Continuation-in-part of application Ser. No. 787,539, Dec. 27, 1968, now abandoned. This application Jan. 8, 1970, Ser. No. 1,499. The portion of the term of this patent subsequent to Aug. 11, 1987, has been disclaimed.
Int. Cl. B01d 19/00; A61m 5/00
U.S. Cl. 55—159 44 Claims



A medicament administration system is provided that can be used once, and then discarded, and that can be used in conjunction with a syringe pump without danger of an embolism, comprising a twin valve T-connector, an air eliminator, and an administering means such as a needle for connection to a patient. A syringe can also be included as an integral part of the system and an administration system combining the syringe is a preferred embodiment. All interconnected components are sterile, and disposable.

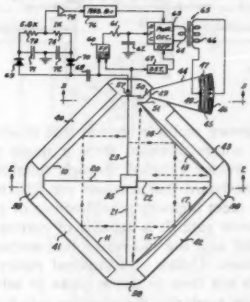
Another optional but preferred feature is an air spring or cushion that absorbs peak pressures arising from pumping action of the syringe plunger, and that is associated with the air eliminator at its upstream side. A visual flow indicator can also be included as a component.

3,650,094

ACOUSTICAL FILTRATION SYSTEM

Raymond Wendell Goodwin, Westport, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Continuation of application Ser. No. 700,827, Jan. 26, 1968, now abandoned. This application Dec. 19, 1969, Ser. No. 882,779
Int. Cl. B01d 50/00
U.S. Cl. 55—277 23 Claims



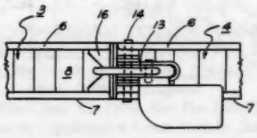
A fluid medium containing suspended particles is subjected to an asymmetrical sound wave having a high velocity in one direction of movement and a low velocity in the opposite direction of movement. The velocities are sufficiently great to produce square-law drag forces; and the suspended particles will be propelled through the fluid medium in a direction corresponding to the high velocity direction of the fluid medium.

3,650,095

GAS FILTER MOUNTING STRUCTURE

Wilson A. Welch, and William A. Medcalf, both of Louisville, Ky.

Filed Jan. 21, 1969, Ser. No. 792,623
Int. Cl. B01d 27/08
U.S. Cl. 55—493 3 Claims



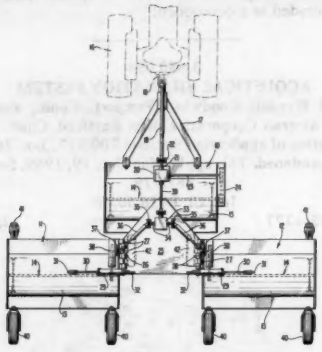
An improved gas filter comprising at least two arc-like filter housing sectors connected in end-to-end relationship to form an annular ring, the ring including sealing strips cooperable with the peripheral wall and adjacent ends of the sectors to permit gas tight engagement of the filter ring relative an annular passage of a plenum defining housing.

3,650,096

MULTIPLE SECTION FOLDABLE FLAIL-TYPE MOWER OR SHREDDER

Frederick C. Caldwell, Corpus Christi, Tex., assignor to E. L. Caldwell & Sons, Inc., Corpus Christi, Tex.

Filed Sept. 24, 1969, Ser. No. 860,629
Int. Cl. A01d *75/30*
U.S. Cl. 56—7 6 Claims



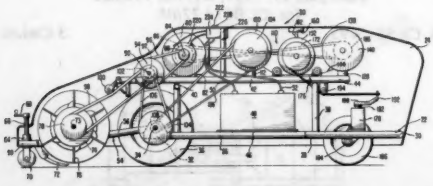
A tractor-drawn multiple section flail machine has its individual flail rotors powered from a single power takeoff shaft of the tractor coupled through suitable transmission means. The outboard flail sections are foldable so that the machine can meet highway specifications or pass through a relatively narrow gate. It is capable of cutting a wide swath when extended and the individual flail sections can follow ground contours. Unlike conventional rotary mowers, the flail rotors do not tend to throw rocks or other debris outwardly, thereby rendering the machine safe for use in public places.

3,650,097

PROGRAMMED STEERING MEANS FOR MOWING APPARATUS OR THE LIKE

Clarence D. Nokes, Washington, D.C., assignor to Warren K. Van Hook, Washington, D.C., a part interest

Continuation of application Ser. No. 650,045, June 29, 1967, now abandoned. This application Mar. 12, 1970, Ser. No. 18,009
Int. Cl. A01d *35/24*
U.S. Cl. 56—10.2 11 Claims



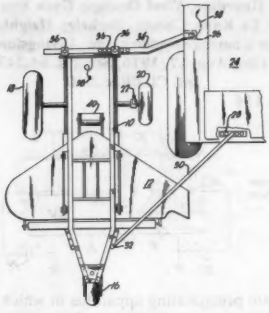
Self-contained apparatus in the nature of a lawn mower for movement over a given land area in a pre-planned route, the apparatus having a frame and a steering mechanism with a tape extending between two reels with intermediate elements contacted sequentially by the tape and operating when contacted to turn the machine.

3,650,098

SEMI-MOUNTED MOWER FOR TRACTORS

Ralph D. Folk, R. R. 3, Huntington, Ind.

Filed Nov. 4, 1970, Ser. No. 86,715
Int. Cl. A01d *35/26*
U.S. Cl. 56—15.5 6 Claims



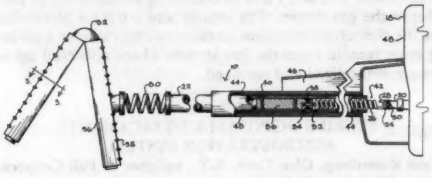
A mower frame rests upon three wheels and is adapted to be secured to either side of a garden or yard tractor. The frame supports an engine powering mower blades. One of the three wheels is cranked or otherwise raised above the ground prior to use.

3,650,099

LIMB SHAKER

Spencer B. Sitter, P.O. Box 415, McLean, Tex.

Filed June 23, 1970, Ser. No. 49,077
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 TS 6 Claims



A tree limb is vibrated to shake the fruit therefrom. A small lightweight internal combustion engine, such as is used for power saws, is used and it is isolated from the boom by a spring and the boom is isolated from the tree engaging finger by a second spring, thereby permitting the boom and limb to have a greater amplitude of movement than the reciprocating exciter of the engine assembly and also the limb engaging finger can move with respect to the boom to accommodate for different angles. The speed of the engine is adjusted to the natural frequency of the limb at which point the limb will have a large amplitude of vibration.

3,650,100

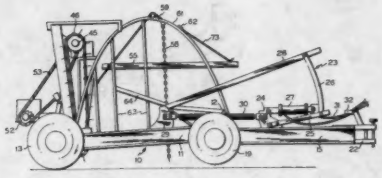
APPARATUS FOR FORMING ROLLS OF HAY

Sherman S. Swan, Jeffersontown, Ky., assignor to Maurice Franklin Swan, Jr., Middletown, Ky. and James V. Naive, Oxon Hill, Md., part interest to each

Filed Dec. 16, 1970, Ser. No. 98,784
Int. Cl. A01d *39/00*
U.S. Cl. 56—341 16 Claims

An apparatus for forming rolls of hay from a swath lying in a field. A wheeled frame has a forward frame portion and a

main frame pivoted at the forward end thereof to the rear end of the forward frame portion. A vehicle lifting means is mounted on the forward frame portion and is coupled to the main frame for pivoting the main frame around the pivotal mounting on the forward frame portion. A downwardly open hay collecting chamber is provided on said main frame and a hay raking and lifting means is mounted on the rear of the main frame for raking the hay in the swath forwardly of the main frame and at the same time lifting it upwardly into said hay collecting chamber. Drive means on the main frame is



coupled to the hay raking and lifting means for driving the hay raking and lifting means. As the apparatus is moved forwardly over a swath of cut hay, the hay is raked and lifted into the hay collecting chamber and rolled up snowball fashion, and when the desired size of roll is achieved, the apparatus is stopped and the vehicle lifting means actuated to raise the rear end of the main frame above the level of the top of the roll of hay, and the apparatus can then be moved forward over the roll of hay.

3,650,101

HAY-MAKING MACHINE

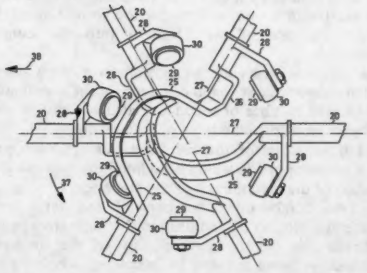
Jerome Aron, Dossenheim/Zinsel, France, assignor to Kuhn Freres & Cie, Societe en commandite simple, Saverne (Bas-Rhin), France

Filed Apr. 10, 1970, Ser. No. 27,260

Claims priority, application Switzerland, Apr. 16, 1969, 5755/69

Int. Cl. A01d *79/02*

U.S. Cl. 56—370 **5 Claims**



A hay-making machine adapted to be attached to and driven by power take-off from a conventional agricultural tractor, and the hay-making machine has at least one rake wheel driven in rotation about a vertical axis, in which rake prongs are controlled by crank arms, connected with prong carriers, on a control track in a section of the rotating movement of the rake wheel in a pivoting movement directed from the ground upwards and contrarily to the direction of rotation of the rake wheel, characterised in that in the case of an even number of radially arranged prong carriers each two mutually diametrically opposed prong carriers have a fixed connection with one another and are controlled commonly by at least one crank arm.

3,650,102

FIBERS FROM NOVOLACS

James Economy, Eggertsville, N.Y., and Rodger A. Clark, Indianapolis, Ind., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 4, 1968, Ser. No. 710,292

Int. Cl. C08g *5/06;* **D01f** *7/00*

U.S. Cl. 57—140 R **12 Claims**

A novolac melt is fiberized to produce a thermoplastic, uncured novolac fiber, and the novolac is cured by heating the fiber in a formaldehyde environment in the presence of an acid catalyst to obtain an infusible, cured novolac fiber.

3,650,103

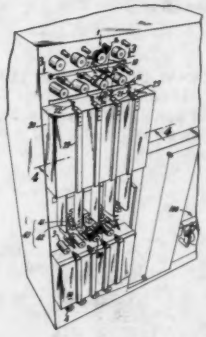
PROCESS AND APPARATUS FOR TEXTURIZING YARN

Henry C. Farrar, Andover; Daniel Shichman, Cedar Grove, and Joseph S. Wos, Ridgefield, all of N.J., assignors to Uniroyal Inc., New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,069

Int. Cl. D02j *13/00;* **D01h** *13/28;* **D02g** *1/02*

U.S. Cl. 57—34 HS **50 Claims**



A process and apparatus for texturizing yarn by false twisting. Means supply yarn to a first novel oven at controlled tension and speed. The yarn is then applied to an air jet twisting assembly having two separate upper and lower bodies with a disc insert with slots to direct and provide a whirling air stream within the twister assembly, thereby providing a false twist to the yarn. An air diffuser is placed between the twisting assembly and the first oven and a second oven is provided after the twisting assembly to heat-relax and remove some of the twist. The tension of the yarn is continuously controlled throughout. Novel means are provided for winding and doffing the texturized yarns as well as for controlling the speed and tension of the yarn throughout.

3,650,104

SPINNING OF TEXTILE YARNS

John Michael Shepherd, Ramsbottom, and Robert Greenwood, Whalley, both of England, assignors to T. M. M. (Research) Limited, Oldham, England

Filed July 18, 1969, Ser. No. 842,924

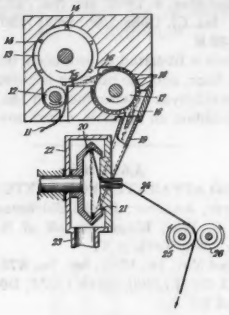
Claims priority, application Great Britain, July 25, 1968, 35,612/68

Int. Cl. D01h *1/12;* **D01g** *1/06*

U.S. Cl. 57—58.91 **13 Claims**

A method of and apparatus for the open end spinning of textile yarns from continuous filaments in which a filament or tow of filaments is continuously advanced to a severing sta-

tion where the filament or tow is severed into fibers of staple length. The staple fibers so formed at the severing station are conveyed in discrete manner to an internal fiber collecting



surface of a spinning rotor from which they are continuously removed to form the tail-end of a yarn which is continuously drawn off from the rotor.

3,650,105

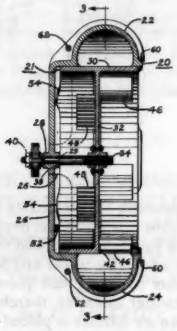
INTERNAL COMBUSTION TURBINE

William J. Toye, 3201 Saint Charles Ave., New Orleans, La.

Filed Apr. 6, 1970, Ser. No. 25,706

Int. Cl. F02c *5/02, 3/14, 3/08*

U.S. Cl. 60—39.43 **1 Claim**



An internal combustion turbine comprising a stator with at least one peripheral combustion chamber and a rotor with peripherally mounted and internally extending driving blades or vanes and air compression blades arranged respectively in two transversely offset arrays of one or more groups in line, the two offset arrays being interiorly separated by a center web. The rotor is mounted for rotation in the stator and as it turns the air compression blades and the driving blades sequentially pass under the stator combustion chamber, the compression blades drawing in air from one side of said center web of the rotor and the driving blades exhausting on the other side of said web. A fuel supply system and an ignition system cooperate to inject fuel into the combustion chamber just after the air compression blades have passed under it and compressing air therein, and to provide a spark to ignite the fuel just as the driving blades begin to pass under the combustion chamber, the products of the ignited fuel pushing against the driving blades to drive the rotor in rotation.

3,650,106

COMBUSTION CHAMBER FOR GAS TURBINE

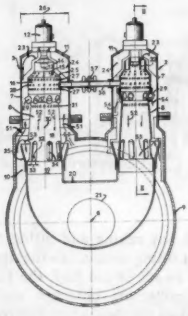
Jack Guillot, Bmanc-Mesni(Seine Saint-Denis), France, assignor to Etablissements Bennes Marrel, Saint-Etienne (Loire), France

Filed Oct. 10, 1969, Ser. No. 865,273

Claims priority, application France, Oct. 18, 1968, 50513

Int. Cl. F02c *7/00, 3/14*

U.S. Cl. 60—39.65 **8 Claims**



Combustion chamber for a gas turbine, comprising two concentric sheet metal casings where the air enters and the compressed gases circulate in contra-current, chiefly notable in that the exterior casing, open at one end to receive the air, is closed at the other end by a cap provided with radial ribs which surround a central jet provided to inject an atomized combustible liquid, this jet opening onto one extremity of the interior casing where it is surrounded by profiled blades fixed slantwise to rotate the air, while this inner casing defines an expanded zone provided with a large number of small slots for the admission of the primary air of combustion, this expanded zone being extended by a short convergent part into which open lateral slots of relatively large diameter for the admission of second air after which the inner casing is continued up to the escape extremity by a divergent zone having wide lateral slots for the admission of coolant air, these slots being surrounded by a deflector fixed on the exterior of the inner shell with a view to prevent the formation of directly opposed currents of air admitted into the combustion chamber.

This combustion chamber can, moreover, show the following characteristics envisaged separately or in combination:

1. An odd number of secondary air slots and an also odd number of slots for the mixing of coolant air.

2. Lateral slots for the secondary air are each provided with a tubular portion which is inclined towards the jet in the direction of the general axis of the chamber.

3. Two combustion chambers of this type are used, mounted parallel to one another in the same transverse plane with reference to the general axis of the turbine, their equilibration being assured by means of a by-pass channel which connects the two expanded zones of the two internal casings.

3,650,107

POWER TRANSMISSION

Kenneth Court, Detroit, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

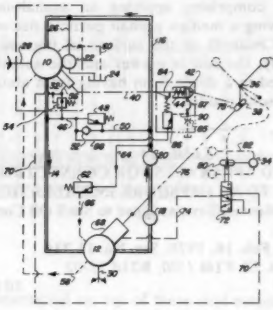
Filed Aug. 12, 1970, Ser. No. 63,137

Int. Cl. F15b *15/18*

U.S. Cl. 60—53 R **13 Claims**

A hydrostatic variable speed and reversible power transmission especially suited for driving mobile equipment has a variable displacement pump with a uni-directional delivery and a variable displacement and reversible hydraulic motor

with a single high-pressure delivery line. Coordinated control of the pump and the motor is obtained by a manual control lever shiftable in a U-shaped pattern to progressively increase the transmission speed ratio forwardly when moved up one leg of the U and reversely when moved up the other leg of the U. A followup servomotor controls the displacement of the driving motor, utilizing a feedback mechanism which is



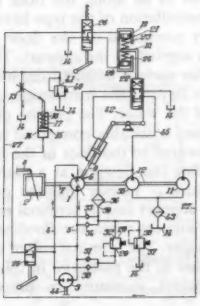
sensitive only to the magnitude of the motor displacement and not to its direction. A pilot valve responsive to shifting of the control handle from one leg to the other of the U reverses the action of the servovalve upon the displacement varying mechanism of the driving motor, and when in mid position serves as an anti-creep bypass.

3,650,108

HYDROSTATIC TRANSMISSION CONTROL

Olivier Isaac, Lyon, France, assignor to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A., Paris, France

Filed Sept. 17, 1969, Ser. No. 858,579
Claims priority, application France, Sept. 20, 1968, 167081
Int. Cl. F16d *31/00*
U.S. Cl. 60—53 R **2 Claims**



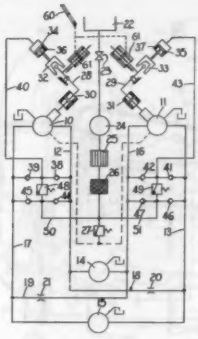
A hydrostatic transmission of the kind useful in an automotive vehicle is controlled automatically by adjustment of the output of a driven hydraulic generator (i.e., a pump) to maintain the torque absorbed by the generator substantially equal to the vehicle driving motor torque. Such adjustment is effected in accordance with fluid pressure established in accordance with the generator speed but modified in accordance with fluid pressure established between the generator and a receptor (i.e., a hydraulic motor) connected hydraulically thereto and connectable mechanically to one or more traction wheels of the vehicle.

3,650,109

HYDRAULIC POWER TRANSMISSION SYSTEMS

Leslie Bernard Freeman, West Pennant Hill, New South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 20, 1970, Ser. No. 39,132
Int. Cl. F02b *73/00*; F16d *31/00*
U.S. Cl. 60—97 E **9 Claims**



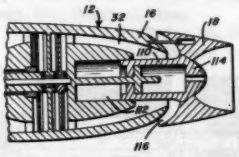
A hydraulic power transmission system has identical pumps and identical motors connected alternately in series. The upstream and the downstream sides of the motors are respectively connected together via flow restrictors. The pumps have a variable stroke and associated with each pump is a means responsive to the pump delivery pressure for limiting the stroke.

3,650,110

REVERSE THRUST DEVICE FOR SUPERSONIC JET ENGINE

John N. Ghougasian, 666 West 188th St., New York, N.Y.

Original application Jan. 10, 1969, Ser. No. 790,256, now Patent No. 3,552,873, dated Jan. 5, 1971. Divided and this application June 2, 1970, Ser. No. 42,723
Int. Cl. F02k *1/20*
U.S. Cl. 60—230 **5 Claims**



Combustion products exiting from the rear turbine of a jet engine are conducted through an annular passage surrounding a rear internal body section slidably mounting an exhaust nozzle blocking piston. The exhaust nozzle is releasably locked to the engine housing in a normal mode of operation and released for displacement by the piston when extended to its nozzle blocking position for engine starting purposes and to form a reverse thrust discharge passage by rearward displacement of the nozzle.

3,650,111

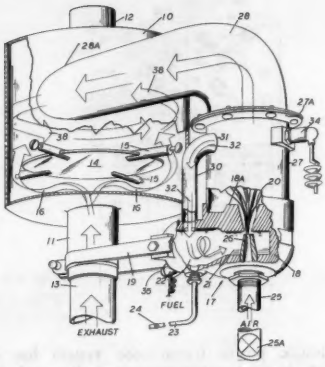
ANTI-POLLUTION AFTER BURNER

Robert Reichhelm, 155 LePore Drive, Lancaster, Pa.

Filed Feb. 16, 1970, Ser. No. 11,665
Int. Cl. F01n *3/12*
U.S. Cl. 60—30 **11 Claims**

This disclosure is directed to an anti-pollution after burner and method for transforming the carbon particles and/or car-

bon monoxide found in exhaust gases discharging to atmosphere to carbon dioxide. This is attained by providing an after burner adjacent an exhaust stack and utilizing a liquid fuel which has been transformed into a substantially gaseous state mixed with excess combustion air prior to ignition. The hot products of combustion thus generated by the after



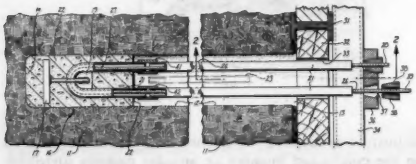
burner are co-mingled with the exhaust products flowing through the stack whereby the heat and excess air of the generated hot gases effect the combustion of the carbon particles and/or the transformation of the carbon monoxide constituent to carbon dioxide.

3,650,112

METHOD OF SHORING AND APPARATUS THEREFOR

George H. Howlett, Oakland, and James W. Howlett, Richmond Annex, both of Calif., assignors to Howlett Machine Works

Filed Sept. 21, 1970, Ser. No. 74,061
Int. Cl. E02d *5/16*
U.S. Cl. 61—35 **16 Claims**



A method of shoring earth matter and the like is disclosed in which a looped flexible tendon is used with a tie-back earth anchor. Once the earth anchor is secured at a predetermined depth in a bore, the looped tendon may be secured at the end of the bore to securement means for shoring the earth adjacent the bore. After shoring is no longer required, the tie-back anchorage may be removed by releasing it from the securement means and pulling on one of the tendon ends to cause tendon to slidably pass around the anchorage means and out of the bore. Various apparatus are disclosed for inserting the looped tendon in the bore with the earth anchor and for maintaining the looped tendon in sliding engagement with the earth anchor for later removal of the tendon.

3,650,113

PROCESS FOR REDUCING WATER PERMEABILITY OF POROUS SOILS

Richard L. Ferm, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 23, 1970, Ser. No. 74,852
Int. Cl. E02d *3/12*
U.S. Cl. 61—36 **11 Claims**

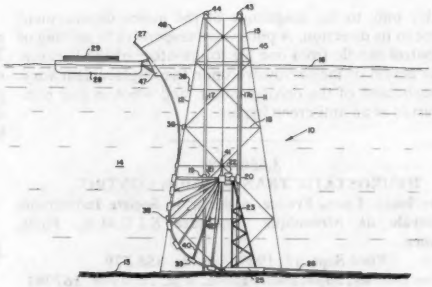
A method of treating porous soils to increase their water-holding capacity comprising applying an asphalt-in-water type emulsion having a median asphalt particle size of from about 0.4 to 1.0 microns to the surface of the soil to be treated. Preferably, the soil is prewet and the submicronic emulsion is applied in a dilute form having from about 1 to about 20 percent solid residue.

3,650,114

METHOD AND APPARATUS FOR CONNECTING A FLOWLINE TO AN OFFSHORE INSTALLATION

William J. Neal, Manvel, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,716
Int. Cl. F16l *1/00*; B21d *11/02*
U.S. Cl. 61—72.3 **10 Claims**



A method and apparatus for connecting a flowline having a major portion adapted to lie along the floor of a body of water to an offshore installation of the type having a substantially vertical support positioned on the floor of a body of water and a platform carried by the support. The flowline is positioned at the water surface adjacent the installation and terminated a distance beyond the installation approximately equal to the depth of the water. The portion of the flowline adjacent the installation is slidably connected to the support and the flowline is lowered to the floor of the body of water while gradually bending the flowline at a plurality of locations therealong in such a manner that the portion of the flowline between the support and its terminal end is substantially parallel to the support when the flowline reaches the floor of the body of water. The terminal end of the flowline is subsequently connected to the platform. In this manner, the flowline has a sufficient curvature to prevent buckling thereof.

3,650,115

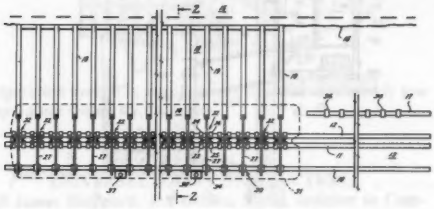
SHIPBUILDING AND LAUNCHING SYSTEMS, METHODS AND APPARATUS

Harry J. Fiegel, Jr., and Russell S. Thatcher, both of Galveston, Tex., assignors to Kelso Marine, Inc., Galveston, Tex.

Filed June 25, 1970, Ser. No. 49,607
Int. Cl. B63c *3/08*
U.S. Cl. 61—67 **24 Claims**

Multiple groups of wheeled truck units are located on railroad tracks which extend from a ship construction area to a

ship launching area adjacent a body of water. Each group of truck units carries an elongated support beam or tilt beam which extends transversely across the railroad tracks and is tiltable in such transverse direction. During the construction phase, the truck units are positioned in the construction area, the tilt beams are maintained in a horizontal position and elongated, slidable skid assemblies are positioned on top of the tilt beams in a lengthwise manner. The hull of the ship is



then constructed on top of these skid assemblies, the longer dimension of the hull running crosswise to the skid assemblies and underlying tilt beams. Launching is accomplished by moving the loaded truck units to the launching area and alongside an inclined launchway structure which slopes downwardly to the adjacent body of water. The tilt beams are tilted and the ship hull and skid assemblies slide down the launchway and into the body of water, the hull entering the water in a sidewise manner.

3,650,116

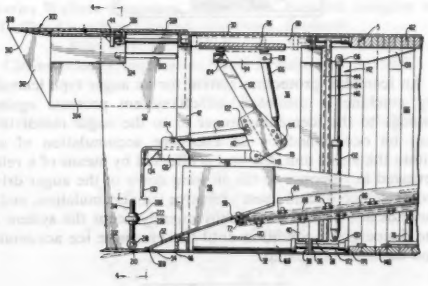
APPARATUS FOR USE IN SUBTERRANEAN EXCAVATION

Isaiah V. Cunningham, P.O. Box 9337 Springhill Station, South Charleston, W. Va.

Continuation-in-part of application Ser. No. 823,407, May 9, 1969. This application Aug. 25, 1970, Ser. No. 66,701

Int. Cl. E01g *3/02*

U.S. Cl. 61—85 **3 Claims**



A multisection shield incorporates means for subterranean excavation and for removal of excavated materials, and provides for the installation of planked lining within the shield. The apparatus is employed in a system of tunnel or conduit lining wherein floor and roof planks are prepositioned, and side wall planks are thereafter wedges in place therebetween. The apparatus further includes a forward safety bonnet operated in advance of excavation, and directional control means.

3,650,117

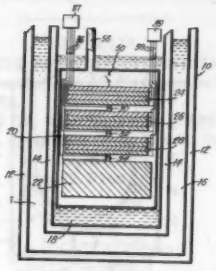
PARAELECTRIC REFRIGERATOR

Max C. Robinson, and Michael R. Wertheimer, both of Montreal, Quebec, Canada, assignors to Canadian Liquid Air Ltd. Air Liquide Canada Ltee, West Montreal, Quebec, Canada

Filed June 8, 1970, Ser. No. 44,432

Int. Cl. F25b *21/02*

U.S. Cl. 62—3 **12 Claims**



A multistage paraelectric refrigerator comprising a plurality of paraelectric refrigeration stages arranged in series between a heat sink and the material to be cooled, each of these stages being connected to or isolated from adjacent stages and the heat sink or material to be cooled by selectively controlled heat switches, the stages themselves being selectively operated.

A method of cooling with a paraelectric refrigerator wherein a plurality of paraelectric refrigeration stages are arranged in a series and are sequentially operated to transfer heat in a quasi-continuous manner from the material to be cooled to a heat sink.

3,650,118

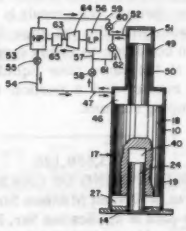
TEMPERATURE-STAGED CRYOGENIC APPARATUS

James A. O'Neil, Bedford, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed Oct. 20, 1969, Ser. No. 867,661

Int. Cl. F25b *9/00*

U.S. Cl. 62—6 **24 Claims**



A cryogenic apparatus in which fluid is circulated between fluid chambers through a fluid flow path including two or more regenerators, the coldest regenerator being positioned in a tubing affixed to the cold end and around which a portion of the displacer moves to define a low-temperature refrigeration chamber. An intermediate-temperature refrigeration chamber is defined within the displacer, thus

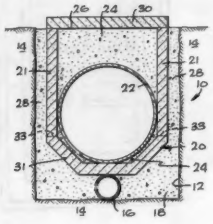
forming a two-staged device with a single displacer. The arrangement is suitable for multistage apparatus and is applicable to several different cycles.

3,650,119

METHOD AND SYSTEM FOR TRANSPORTING OIL BY PIPE LINE

Joseph T. Sparling, 1295 Acadia Road, Vancouver, 8 British Columbia, Canada

Filed Apr. 2, 1970, Ser. No. 25,029
Int. Cl. F17d *1/14*
U.S. Cl. 62—55 **22 Claims**



System and method for transporting oil by pipe line under or over frozen ground, e.g., permanently frozen terrain, without melting or softening the ground by heat transfer from the oil, by passing oil through a pipe line supported by such frozen ground or terrain, placing a second pipe line for carrying a fluid refrigerant, particularly liquid natural gas, along and closely adjacent to the oil pipe line but spaced therefrom, the second pipe line also being supported by the frozen ground, and being disposed adjacent to the frozen ground, providing insulation between the oil and refrigerant, e.g., liquid natural gas, pipe lines, as by placing the oil pipe line in an excavation in the ground and positioning the liquid natural gas pipe line in such excavation below and parallel to the oil pipe line, with gravel, for example, filling the spaces in the excavation and between the two pipe lines, passing a liquid refrigerant such as liquid natural gas through the second pipe line at a temperature substantially below the temperature of the adjacent frozen ground, thereby maintaining the ground around the pipe lines frozen without cooling the oil in the oil pipe line down to a temperature which substantially retards flow of the oil in the oil pipe line. As a feature of the invention, a minor portion of the liquid natural gas at each pumping station can be used for operating both the oil pump or pumps and liquid natural gas pump or pumps at the respective stations. The result is that the ground supporting or surrounding the oil pipe line remains in permanently frozen condition to firmly support such pipe line at all times, and at the same time liquid natural gas can be transported to market and a portion thereof employed to operate the pumping stations.

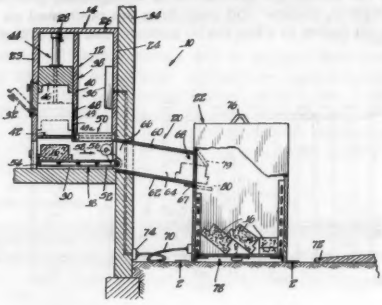
3,650,120

METHOD FOR DISPOSING OF GARBAGE AND REFUSE

Richard D. Harza, 400 West Madison Street, Chicago, Ill.

Continuation-in-part of application Ser. No. 677,206, Oct. 23, 1967, now Patent No. 3,514,969, which is a continuation of Ser. No. 824,874, May 15, 1969, abandoned. This application Apr. 20, 1970, Ser. No. 30,015
Int. Cl. F25d *25/00*; 100 *93*
U.S. Cl. 62—62 **15 Claims**

A system of disposing of garbage and refuse which comprises in any order or sequence the steps of: wetting the refuse (if it does not already contain significant moisture) with a freezable liquid; compressing the moistened refuse; freezing the moistened, compacted refuse into dense pellets of any size or shape; storing the pellets; removal and ultimate



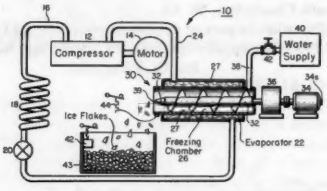
disposal of the pellets for landfill or otherwise through any systematic means.

3,650,121

ICEMAKER PROTECTION SYSTEM

Frank A. Kimpel, and William F. Markley, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1969, Ser. No. 887,260
Int. Cl. F25c *7/00*
U.S. Cl. 62—136 **6 Claims**



An icemaker protection system for an auger type icemaking machine is disclosed, which system protects against damage to the icemaking auger or to the auger motor that may be occasioned by an excessive accumulation of ice within the auger unit. Control is effected by means of a relay actuated in response to the slowing down of the auger drive motor, which occurs upon excessive ice accumulation, and a thermostatic switch which subsequently keeps the system in the deenergized condition until the excessive ice accumulation has been dissipated.

3,650,122

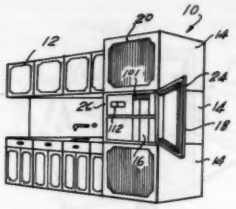
MODULAR REFRIGERATION UNIT

Aharon Lieberman, Ozone Park, N.Y., assignor to Computed Living Space, Inc., Ozone Park, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,168
Int. Cl. F25d *19/00*
U.S. Cl. 62—298 **13 Claims**

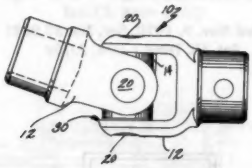
A modular refrigeration unit containing a complete refrigeration system is removably mounted in an insulated holding chamber. The holding chamber and refrigeration unit are formed of polyurethane in a stressed skinned construc-

tion and a closed air flow cycle is provided between the interior of the holding chamber and the evaporator of the



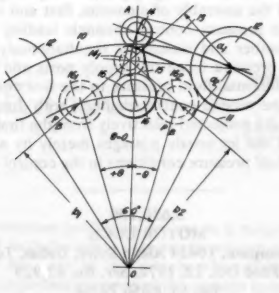
refrigeration system to continuously maintain a relatively low temperature within the chamber.

3,650,123
UNIVERSAL JOINT CONSTRUCTION
Cecil James Sheppard, Jr., Gobles, Mich., assignor to Compact Tractor Industries, Inc., Allegan, Mich.
Filed Apr. 1, 1970, Ser. No. 24,704
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 SP **10 Claims**



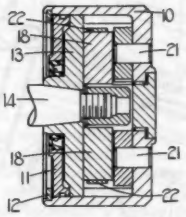
A permanently lubricated and sealed universal joint utilizing an annular element constituting both a thrust washer and a seal for retaining grease, the element having a flexible sealing flange around its outside diameter, a rigid centering flange depending from the internal diameter, and thrust bearing surfaces, one of which has equally angularly spaced grease-retaining pockets.

3,650,124
ROTATABLE COUPLINGS
Charles Wallace Chapman, Winchelsea, England, assignor to Twiflex Couplings Limited, Middlesex, England
Filed Nov. 14, 1969, Ser. No. 876,679
Claims priority, application Great Britain, Jan. 3, 1969, 633/69
Int. Cl. F16d *3/14*
U.S. Cl. 64—19 **4 Claims**



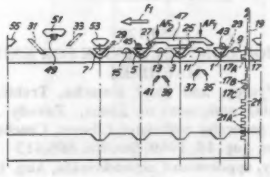
A rotatable coupling comprises rotatable driving and driven members between which is pivotally connected one or more linkages each comprising tangential and radial links connected together by a pivotal connection. The distance between the pivotal connections at the ends of the tangential link is not less than 0.35 of the radial distance between the axis of rotation of the coupling and the pivotal connection between the tangential link and the driving or driven member. The linkage is so arranged as to be deformed by relative rotation between the driving and driven members in at least one direction. The deformation is opposed by a resilient bush at the pivot between the two links and at least the major part of the torque transmitted by the coupling, in its normal operating speed range, is transmitted by tension in the links caused by straining the resilient bush.

3,650,125
SPEED RESPONSIVE DEVICES
Ronald Phillips, Northolt, England, assignor to Motorola, Inc., Franklin Park, Ill.
Filed Oct. 9, 1970, Ser. No. 79,503
Claims priority, application Great Britain, Oct. 10, 1969, 49,784//69
Int. Cl. F16d *5/00*
U.S. Cl. 64—25 **4 Claims**



A speed responsive device including a pair of rotary members, a mass movable outwardly under the action of centrifugal force such outward movement of the mass imparting relative angular movement of the members and spring means for restraining outward movement of the mass. The spring means comprises a pair of coiled tension springs which are connected to a leaf spring engaging with an outer curved surface of the mass. The initial radius of curvature of the leaf spring is greater than that of the aforesaid surface and means is provided to limit the extension of the tension springs.

3,650,126
PROCESS FOR MANUFACTURE OF STOCKING HEEL POUCHES
Vinicio Luchi, Via G.F. Mariti 102, Firenze, Italy
Filed Dec. 24, 1968, Ser. No. 786,598
Claims priority, application Italy, Dec. 29, 1967, 4863/67
Int. Cl. D04b *9/20*
U.S. Cl. 66—48 **3 Claims**



A process for manufacture of stocking heel pouches includes the use of a circular knitting machine cylinder with a row of needles and a row of sub-needles overlying one

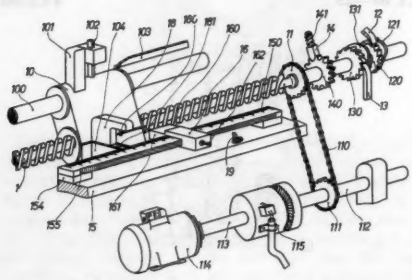
another, and butts and control cams which are arranged in arcs which are staggered with respect to one another. The extent of the arcs can be varied. A group of stitch courses in one direction is reversed in the next group of courses.

3,650,127

THREAD-GUIDE SETTING DEVICE FOR STRAIGHT-BAR KNITTING MACHINES

Heinrich Niestroj, and Hans Tille, both of Ingolstadt, Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengellschaft, Ingolstadt, Germany

Filed Feb. 1, 1968, Ser. No. 702,302
Claims priority, application Germany, Feb. 2, 1967, Sch 40168
Int. Cl. D04b *15/52*
U.S. Cl. 66—126 **23 Claims**



A primary switch of a control circuit is closed to energize a motor and clutch to drive a carriage for relocating positive stops limiting travel of one or more thread guides and to energize a signalling device. The carriage and thread-guide stops are precisely positioned automatically by interposition of a preset blocking member between the source of a light beam, magnetic field or air jet of the signalling device and its signal receiver to open a secondary switch in the control circuit and thereby affect instantaneous deenergization of the motor and clutch and actuation of an auxiliary lock to prevent overtravel of the carriage on its feed screw. Alternatively, the clutch may be disengaged by a photoelectric counter responsive to the angle of rotation of the feed screw. Several signalling devices and receivers may be mounted on the carriage and connected in parallel to open sequentially secondary switches in the control circuit, in which case the primary switch is a sequential or stepping selector switch.

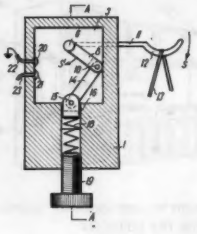
3,650,128

STOP MOTION CONTROL DEVICE FOR KNITTING MACHINES

Josef Ferda, Vycepy, and Josef Kotacka, Trebic, both of Czechoslovakia, assignors to Elitex, Zavody textilniho Strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

Filed Aug. 15, 1969, Ser. No. 850,613
Claims priority, application Czechoslovakia, Aug. 16, 1968, 5935/68
Int. Cl. D04b *35/10*
U.S. Cl. 66—163 **6 Claims**

Apparatus for controlling the operation of a knitting machine in response to the tension of the yarn comprising a crank member having a yarn guide fixed thereto, and being resiliently biased in one direction, the crank being reversible



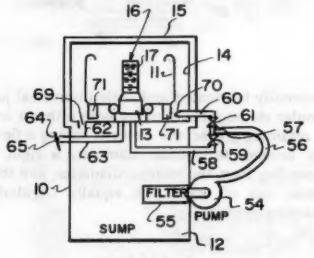
in response to a predetermined tension to operate control means for stopping the machine.

3,650,129

ARTICLE WASHING APPARATUS

Francis R. Scroop, Albuquerque, N. Mex., and John F. Gebhard, Stevensville, Mich., assignors to Whirlpool Corporation

Filed Nov. 9, 1970, Ser. No. 87,967
Int. Cl. D06f *17/04, 23/04*
U.S. Cl. 68—23.5 **12 Claims**



An automatic article washing apparatus including a container for washing liquid and the articles such as articles of clothing being washed, liquid jet means in the container comprising a stacked assembly of a plurality of bistable fluidic switch amplifier elements each having a washing liquid supply port, an interaction chamber receiving liquid from the port, first and second diverging jet nozzle passages leading from each of the assembly of elements, first and second differential fluid pressure control channels leading to the interaction chamber and means for simultaneously supplying liquid under pressure to all the supply ports and means for providing differential fluid pressure to the first control channels and to the second control channels with the result that jets of liquid are projected selectively from the first jet nozzle passages and the jet nozzle passages merely by altering the differential fluid pressure conditions in the control channels.

3,650,130

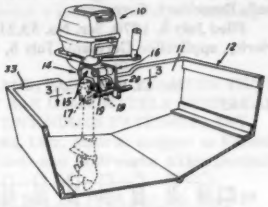
MOTOR LOCK

Grady E. Thompson, 10424 Aledo Drive, Dallas, Tex.

Filed Oct. 22, 1970, Ser. No. 82,929
Int. Cl. E05b *73/00*
U.S. Cl. 70—58 **5 Claims**

A lock device for preventing theft of outboard motors which locks the thumb screws of the mount bracket of an

outdoor motor against rotation to prevent removal of the outboard motor from the transom of a boat to which it is secured.

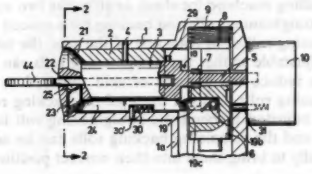


3,650,131

IGNITION AND STEERING LOCK FOR MOTOR CAR

Rudolf Eichenauer, Hollbergstrasse 1, 6 Frankfurt/M, Germany

Filed Dec. 15, 1969, Ser. No. 885,390
Claims priority, application Germany, Dec. 17, 1968, P 18 15 152.5; Feb. 11, 1969, P 19 06 731.7; July 14, 1969, P 19 35 629.7
Int. Cl. B60r *25/02*
U.S. Cl. 70—252 **16 Claims**



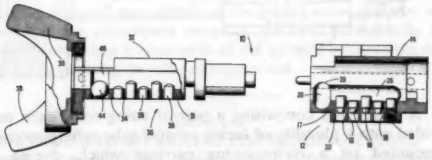
A combined ignition and steering lock for automotive vehicles including means for simultaneously actuating the ignition system and a steering mechanism arresting bolt, and means operable on location of a key in the opening to lock the arresting bolt out of engagement with the steering mechanism.

3,650,132

LOCK

Felix J. Berube, 153 River St., Sanford, Maine

Filed Aug. 6, 1970, Ser. No. 61,611
Int. Cl. E05b *27/00*
U.S. Cl. 70—364 A **5 Claims**



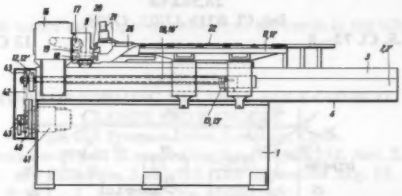
A lock mechanism preferably for use in a motor vehicle is disclosed and includes safety features to prevent an operator from leaving the keys in the vehicle when it is left unattended. One important purpose of the present invention is to provide means for preventing the operator from starting the vehicle after a proper key has unlocked the lock mechanism, without first withdrawing the key from the lock mechanism. After the key has been extracted, the lock mechanism can then be rotated to a vehicle start position, and the key need not be inserted again to thereafter rotate the lock mechanism to its locked position.

3,650,133

LONGITUDINAL CARRIAGE DRIVE FOR CO-ORDINATES TABLES IN MACHINE TOOLS, PARTICULARLY PUNCHING MACHINES

Walter Bredow, Alfeld an der Leine, Germany, assignor to C. Behrens Aktiengesellschaft, Alfeld an der Leine, Germany

Filed Sept. 3, 1969, Ser. No. 854,851
Claims priority, application Germany, Sept. 17, 1968, P 17 77 180.1
Int. Cl. B21d *55/00, 43/00;* **B26d** *7/06*
U.S. Cl. 72—1 **3 Claims**



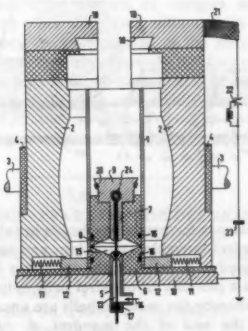
A longitudinal carriage drive for co-ordinates tables in machine tools for impelling the carriages on co-ordinates tables, particularly the longitudinal carriage, with the transverse carriage moving thereupon transversely to the longitudinal axis of the machine, and to the material to be punched held fast thereto, in which a power transmission by two screw-threaded spindles is provided to the left and right of the center of the machine, which receive their drive synchronously from a motor arranged at about the middle of the table.

3,650,134

DEVICE FOR FORMING WORKPIECES BY LIQUID PRESSURE WAVES

Jochen Haeusler, Nurnberg-Laufamholz, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 11, 1969, Ser. No. 884,618
Claims priority, application Germany, Dec. 19, 1968, P 18 15 540.3
Int. Cl. B21d *26/10*
U.S. Cl. 72—56 **5 Claims**



A device for forming a workpiece by pressure waves generated in a liquid due to an undersurface spark discharge has a pair of electrodes mutually separated by the liquid and

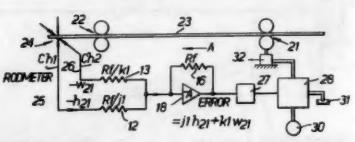
defining a spark gap therebetween. The electrodes are connected to a spark discharge circuit. One of the electrodes has a stationary part and a moveable part. An ignitor is connected to the moveable part and is thereby moveably insertable into the device so that the ignitor extends across the spark gap between the other of the electrodes and the one electrode. A means for holding a workpiece in a position surrounding the ignitor and the spark gap is also provided.

3,650,135

CONTROL FOR ROLLING MEANS HAVING SUCCESSIVE ROLLING STANDS

Charles Roger Skelton, Dronfield, Sheffield, and Dalip Tarachand Malkani, Chesterfield, both of England, assignors to The British Iron and Steel Research Association

Filed June 12, 1969, Ser. No. 832,571
Claims priority, application Great Britain, June 14, 1968, 28,562/68
Int. Cl. B21b *37/02, 37/08*
U.S. Cl. 72—8 **12 Claims**



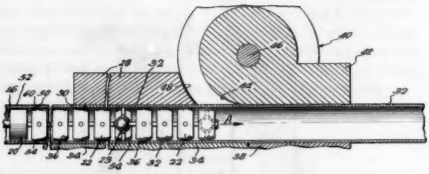
This invention is concerned with the automatic rolling of stock other than strip, plate, sheet and the like. The rolling is carried out in at least two passes and the rolling operation is controlled by adjusting at least one of the following four parameters: roll speed and screwdown of the first of the passes; roll speed and screwdown of the second of the passes, in response to at least one of: direct stock measurement; direct mill measurement; indirect stock measurement; indirect mill measurement.

3,650,136

TUBE BENDING APPARATUS

Ernest C. Sindelar, Sugar Grove, Ill., assignor to Pines Engineering Co., Inc.

Filed Oct. 10, 1969, Ser. No. 865,287
Int. Cl. B21d *9/05, 5/04*
U.S. Cl. 72—150 **10 Claims**



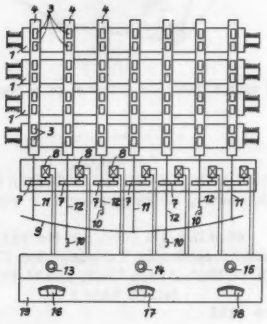
In an apparatus for producing bends in tubing, including a flexible mandrel movable axially into and out of one end of tubing disposed in position on the apparatus for bending. The mandrel has a plurality of mandrel balls universally mounted in a chain whereby the mandrel balls are unsupported against gravity on the end of the mandrel. A cylindrical reload member is disposed adjacent the one end of the positioned tubing for receiving the mandrel and orienting the mandrel balls when outside of the positioned tubing to align the mandrel balls for insertion into the tubing.

3,650,137

LEVELLING MACHINE FOR SHEET AND STRIP METAL

Willi Benz, Neuss, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed July 8, 1970, Ser. No. 53,219
Claims priority, application Germany, July 8, 1969, P 19 34 496.8
Int. Cl. B21d *1/02*
U.S. Cl. 72—165 **7 Claims**



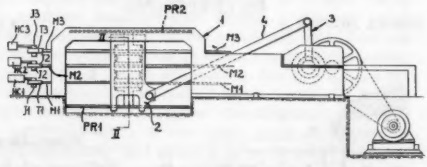
A levelling machine for sheet or strip has two co-operating sets of straightening rolls and backing rolls spaced along each straightening roll of at least one of the sets, the backing rolls being adjustable so that the straightening rolls can be bent. In order to reduce the amount of skill required to adjust the straightening rolls, at least three of the backing rolls can be directly adjusted to bend the straightening roll in a desired manner and the remaining backing rolls can be adjusted automatically to bring them into their correct positions.

3,650,138

MULTIPLE TUBE-ROLLING PILGER MILLS

Giuseppe Persico, 69, Via Pio X, Volpago Del Montello (Treviso), Italy

Filed Sept. 23, 1969, Ser. No. 860,297
Claims priority, application Italy, Sept. 28, 1968, 7364 A/68; July 23, 1969, 7198 A/69
Int. Cl. B21b *21/00*
U.S. Cl. 72—189 **6 Claims**



A pilger mill comprising a pair of sizing rolls, each provided with a plurality of facing parallel tube-rolling grooves, mounted on a reciprocating carriage which, during its reciprocation, drives by means of a rack-and pinion transmission the roll pairs at the unison and in opposite directions. Each roll groove comprises a reducing section and an idle section. The reducing sections of each groove pair are angularly offset with respect to the reducing sections of the other grooves of each roll so that, in operation, the reducing of only one tube at a time is effected.

The idle sections of all parallel grooves extend for an angle including an idle angle fraction which is aligned in all grooves. Said idle angle fractions encircle with a certain

clearance the tube sections therebetween, thus permitting the forward stroke of the reciprocating carriage.

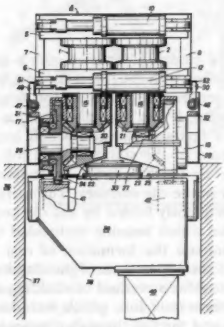
At least one pair of roll grooves comprises, in addition to the reducing sector, a tube-smoothing or finishing sector.

3,650,139

ROLLING STAND, PARTICULARLY FOR THE SHAPING OF A CAST BAR IMMEDIATELY UPON LEAVING A CONTINUOUS CASTING PLANT

Ernst Hinterholzl, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed July 24, 1969, Ser. No. 844,337
Claims priority, application Austria, Apr. 23, 1969, A 3911/69
Int. Cl. B21b *31/08, 35/00*
U.S. Cl. 72—249 **2 Claims**



A rolling stand, particularly intended for shaping a cast bar immediately upon leaving a continuous casting plant, is described, comprising two horizontal roll supports having their ends connected by a fixed crossmember on one side and a releasable cap on the other side to form a cage wherein a pair of vertical rolls mounted in inserts is arranged to be horizontally displaceable for adjustment of the roll gap. According to the invention the entire rolling stand including the rolls is detachably mounted on a base frame to be vertically removable therefrom, said base frame containing two transmission gears releasably connected for rotation with the roll shafts and enclosed in suspended casings which are moveable together with said rolls; the drive is located below floor and comprises driving spur wheels which are larger than the meshing drive-off spur wheels of the transmission gears by at least half the adjustment range of the rolls to maintain a stress-transmitting engagement of the gearing irrespective of any shifts occuring on roll gap adjustment.

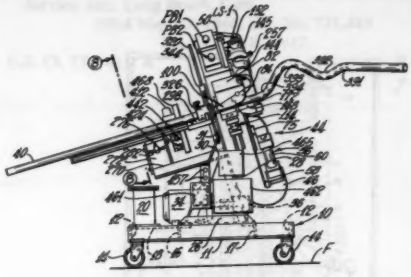
3,650,140

METHOD AND APPARATUS FOR BENDING TUBING

Daniel A. Zmuda, Toledo, Ohio, assignor to Questor Corporation, Toledo, Ohio

Original application June 12, 1968, Ser. No. 736,317, now Patent No. 3,557,586. Divided and this application Nov. 3, 1970, Ser. No. 86,570
Int. Cl. B21d *11/02*
U.S. Cl. 72—296 **9 Claims**

This invention embraces a method of and apparatus for forming or impressing successive bends in tubing, such as exhaust pipes for internal combustion engine exhaust systems, the method and apparatus providing for forming successive bends of various depths and angularities while maintaining positive control of the tubing during the successive operations to assure the proper orientation of the bends in the tubing.

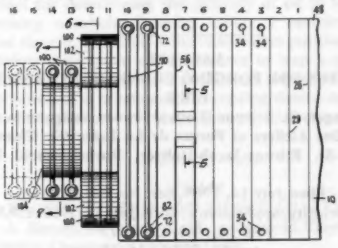


3,650,141

METHOD OF FORMING MULTIPLE HOLE CONDUIT CLAMPS AND HANGERS

Frank W. Pepe, 637 Prospect Drive, Lordship, Conn.

Continuation-in-part of application Ser. No. 680,252, Nov. 2, 1967, now Patent No. 3,461,708. This application Aug. 15, 1969, Ser. No. 850,525
Int. Cl. B21d *21/00, 28/06, 53/36*
U.S. Cl. 72—332 **10 Claims**



A method of continuously forming multiple hole conduit clamps and hangers from flat strip stock wherein individual clamps or hangers are blanked in side by side relationship longitudinally of the strip but only partially across the width of the strip so as to leave a central unblanked portion, and subsequently formed in even numbered multiples by intermittent feeding of the strip stock through a progressive die punch press. Individual clamps or hangers are partially severed from each other along their ultimate side edges leaving a central carry through portion of the strip within the clamp blank length, then progressively die formed by deformation from the free ends of each clamp or hanger blank toward the center of the strip, and finally severed from the strip in multiples of adjacent pairs of finished clamps or hangers by punching alternate clamps or hangers in opposite directions.

3,650,142

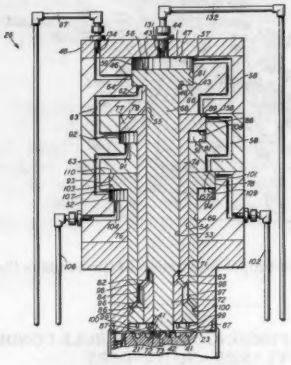
METHOD OF AND APPARATUS FOR DECREASING THE SPACING BETWEEN ARTICLES

William M. Baldwin, Jr., and Vincent A. Rayburn, both of Baltimore, Md., assignors to Western Electric Company Incorporated, New York, N.Y.

Filed July 18, 1969, Ser. No. 843,107
Int. Cl. B21j *9/12*
U.S. Cl. 72—403 **17 Claims**

The spacing between articles depending from a deformable strip of stock material is decreased by crimping the strip between each adjacent pair of articles. The crimps are

formed at spaced intervals starting with the centermost portions of the strip and progressing outwardly therefrom until a crimp is formed between each adjacent article pair. Crimping



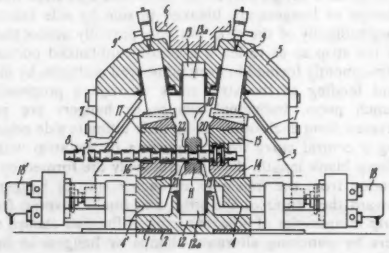
is accomplished by an arrangement of concentric piston-rams which are sequentially moved to advance pairs of forming tools to crimp and decrease the length of the strip of stock material.

3,650,143

APPARATUS FOR FORGING CRANKSHAFTS AND THE LIKE

Gabriel Ruget, St. Etienne (Loire), France, assignor to Compagnie Des Ateliers et Forges de La Loire (St. Chamond-Firmidy-St. Etienne-Jacob-Holtzer, Rochefoucauld Paris, France

Filed July 14, 1969, Ser. No. 841,272
Claims priority, application France, July 19, 1968, 159,915; Feb. 24, 1969, 6,904,677
Int. Cl. B21d *37/00*
U.S. Cl. 72—412 **3 Claims**



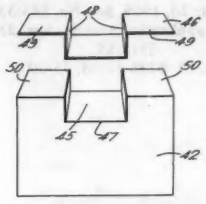
Improvement in apparatus for forging crankshafts and like workpieces. This improvement is characterized in that an upper crankpin die is mounted on a piston movable in relation to an upper cross member which is actuated by the ram of a forging press, said piston being responsive to a hydraulic ram having its cylinder carried by said cross member. The pressure developed in said ram is adjustable by means of a discharge valve set according to the dimensions of the workpiece to be forged, said valve permitting of performing the forging operation in two steps, i.e., firstly upsetting the metal while offsetting the crankpin, then forging the crankshaft webs at the end of the upsetting step.

3,650,144

APPARATUS FOR CLADDING ELONGATED ARTICLES WITH STAINLESS STEEL FOIL

David James, Coychurch, near Bridgend, Glamorgan, Wales, assignor to Drawn & Rolled Sections Limited, Glamorgan, England

Filed July 2, 1969, Ser. No. 838,457
Claims priority, application Great Britain, July 4, 1968, 31,931/68
Int. Cl. B21d *3/00*
U.S. Cl. 72—467 **4 Claims**



In the cladding of elongated articles with a stainless steel foil, the article together with the foil is fed to a wrapping die, which is shaped to progressively fold the foil around the elongated article. Hitherto, it has been the practice to form the die entirely from a ferrous material, which because of the relatively hard nature of the stainless steel foil, wears considerably with the result that swarf or contaminants may become embedded in the die surfaces. The surfaces of stainless steel foils subsequently folded by the die become scored and pitted. Particles which become embedded the damaged foil surfaces can initiate the formation of rust, resulting in rapid detioration of the appearance of the cladded article.

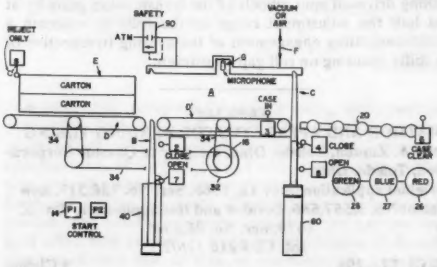
The invention provides a method of cladding an elongated article with a stainless steel foil, which includes the step of feeding the article and the foil through a wrapping or binder die which is provided, at least on the inner surface portion of the die which is in contact with the foil, with a replaceable non-ferrous liner. Apparatus for cladding an elongated article with stainless steel foil is also disclosed.

3,650,145

METHOD AND APPARATUS FOR TESTING HERMETICALLY-SEALED CONTAINERS

Lloyd A. Nelson, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Continuation-in-part of application Ser. No. 694,444, Dec. 29, 1967, now Patent No. 3,513,689. This application Feb. 5, 1970, Ser. No. 8,906. The portion of the term of this patent subsequent to May 26, 1987, has been disclaimed.
Int. Cl. G01m *3/02*
U.S. Cl. 73—37 **15 Claims**



A method for automatically detecting unsatisfactorily sealed containers including sequentially receiving, externally

pressure modifying and subsequently testing hermetically sealed containers traveling along a conveyed path. The method includes the detection of any impulse that may be emitted as a result of cover diaphragm movement in those container(s) having insufficient vacuum. When such an audible emission occurs, the containers are rejected. The disclosure is also directed to apparatus for accomplishing this method.

3,650,146

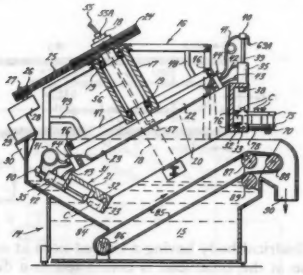
CONTAINER PRESSURE TESTING APPARATUS

Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Filed June 2, 1970, Ser. No. 42,683

Int. Cl. G01m *3/02*

U.S. Cl. 73—37 **11 Claims**



Apparatus for testing containers for load and internal pressure resistance within the requirements of commercial specifications by subjecting a moving stream of containers to axial loading as well as high internal pressure loading while submerged in a shock absorbing bath to control fragmentation upon failures.

3,650,147

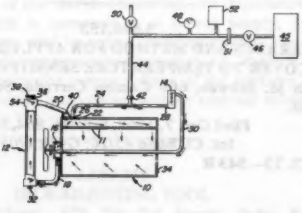
COOLING SYSTEM PRESSURE TESTER

Robert G. Moyer, Ridgefield, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 26, 1970, Ser. No. 50,202

Int. Cl. G01m *3/04*

U.S. Cl. 73—49.7 **11 Claims**



A cooling system pressure tester for automotive engine cooling systems and a method for pressure testing such systems. The pressure tester comprises a fitting having outlets connected in line with the heater system conduit, a conduit connected between a source of pressurized water and the inlet of the fitting, and means for controlling and means for measuring the pressure in the system. The entire automotive engine cooling system may be pressure tested at one time.

3,650,148

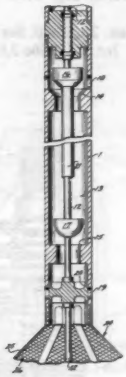
TOOL TO DETERMINE QUANTITY OF OIL

James J. Glenn, Jr., Long Beach, Calif., assignor to Triangle Service, Inc., Long Beach, Calif.

Filed May 23, 1968, Ser. No. 731,445

Int. Cl. E21B *47/12*

U.S. Cl. 73—61.1 R **9 Claims**



A tool for determining the quantity of oil in an oil well comprising a tubular housing having a sample chamber located therein. Remotely controlled valves positioned above and below the sample chamber serve to trap a sample for measurement. An electrode positioned within the chamber and connected to a resistance recording device on the surface measures the amount of oil in an oil-water mixture in the sample chamber.

3,650,149

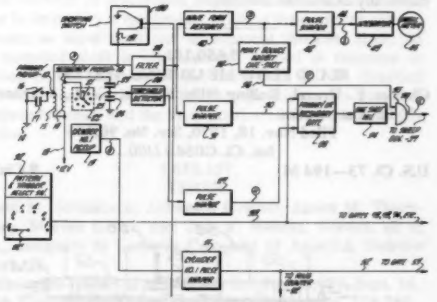
ENGINE IGNITION AND POWER ANALYZER

Peter A. Howes, La Verne, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Jan. 21, 1969, Ser. No. 792,382

Int. Cl. G01m *15/00*

U.S. Cl. 73—117.3 **38 Claims**



An internal combustion engine performance analyzing system is described for displaying a number of operating characteristics, such as engine ignition and cylinder power, which exists under selectively controlled operating conditions. Simple connections to the engine provide the necessary signals to the solid-state electronic analyzer. Various pattern display modes may be selected. An anticipatory cylinder fire signal, which is related to crankshaft rotational degrees, per-

mits a given cylinder to be shorted for the desired interval, regardless of the engine speed. This anticipatory cylinder fire signal is obtained from a servoed ramp waveform generator. Individual cylinder waveform patterns are synchronously and simultaneously displayed on an oscilloscope.

3,650,150

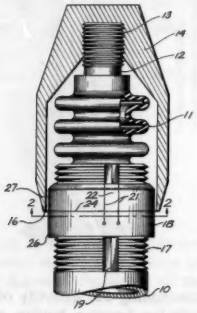
TIRE PRESSURE INDICATION

Willet Lawrence Eccles, Jr., 1709 Hansconi Drive, South Pasadena, Calif.

Filed Jan. 28, 1970, Ser. No. 6,457

Int. Cl. B60c *23/00*

U.S. Cl. 73—146.8 **11 Claims**



A tire pressure indicator is disclosed in the form of an improved valve stem. A cap is mounted on the valve stem and an elastically extensible member responsive to the pressure within the tire is provided between the rigid portion of the stem and the portion on which the cap is mounted so that the cap moves relative to the rigid portion of the stem in response to tire pressure. A measuring indication or plurality of indications are provided on the stem adjacent the end of the skirt of the cap for indicating proper tire pressure. In one embodiment and the measuring indicator is on a sleeve threaded on the stem and having a detent for locking the sleeve in a selected position indicative of tire pressure. In another embodiment a detent in the cap permits adjustment to a selected pressure as measured in fixed indicia on the valve stem. A rubber or plastic bellows either alone or supplemented by a metal spring is preferably employed as the elastically extensible member.

3,650,151

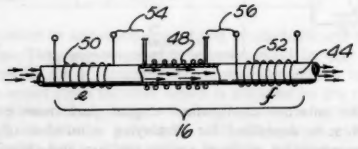
FLUID FLOW MEASURING SYSTEM

Charles F. Drexel, Rolling Hills Estates, Calif., assignor to Tylan Corporation

Filed Nov. 18, 1970, Ser. No. 90,556

Int. Cl. G05d *11/00*

U.S. Cl. 73—194 M **9 Claims**



A control system for the vaporization of a liquid by a carrier gas in which the carrier gas passes through a first set of resistance elements in a terminal conductivity cell, then through a mass flow sensor and, via a throttling valve, into a vaporizing tank of diluent where the carrier gas picks up diluent vapor and then passes through a second set of resistance elements in the thermal conductivity cell. The resistance elements are connected in a bridge circuit yielding an output voltage representing the volume ratio of diluent to carrier gas. This voltage is multiplied by the voltage derived from the mass flow sensor to yield a voltage which represents the absolute value of mass flow rate of diluent. This value is compared to a desired value, the differential being amplified and utilized to control the throttling valve.

3,650,152

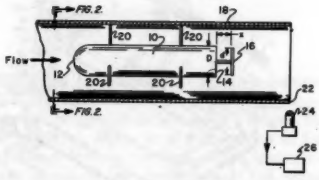
APPARATUS AND METHOD FOR MEASURING THE VELOCITY OF A FLOWING FLUID

Douglas F. White, Bedminster, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Feb. 13, 1968, Ser. No. 705,061

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 B **12 Claims**



A cylindrical body having a curved nose at one end and a flat base at the other end is connected to a disc of smaller diameter, with the disc being centered coincident with the longitudinal axis of the body and being spaced axially from the base thereof. This assembly, when aligned axially at midstream of a flowing fluid with the nose pointed upstream, generates a downstream wake in which the fluid traces an unsteady, irregular flow pattern, oscillatory in nature but with random, unpredictable variations and extinctions in the amplitude and frequency thereof. Modification of the assembly by an additional element of structure which splits or obstructs the fluid flow at or downstream from the space between the base and disc stabilizes the wake flow pattern into a fixed plane of strong oscillations the amplitude and frequency of which are readily measured. The frequency of the stabilized oscillations varies directly with the volumetric velocity of the fluid flow over a considerable range of velocities, whereby the modified assembly constitutes a simpler, linear, normoving parts, digital-output flowmeter by which the fluid flow velocity can be readily measured with high precision.

3,650,153

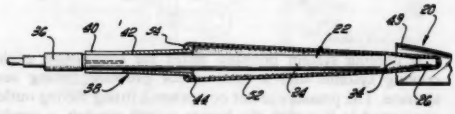
APPARATUS AND METHOD FOR APPLYING STERILE COVER TO TEMPERATURE SENSITIVE PROBE

Ardath M. Schwab, 606 Camino Cerrado, South Pasadena, Calif.

Filed Oct. 7, 1969, Ser. No. 864,385

Int. Cl. B65d *85/20;* **G01k** *1/08*

U.S. Cl. 73—343 R **3 Claims**



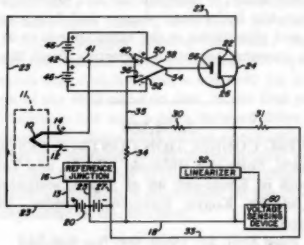
A sleeve is slidably mounted between stop means and in a slight friction fit upon a cylindrical temperature sensitive

probe and has a radially outwardly extending rim about an end thereof which is movable beyond the probe end to be inserted into a sterile flexible package. An elastic ring on the end of a latex probe cover fits over said sleeve rim while said sleeve is inserted into the package whereupon sliding movement of the sleeve down the probe places the sterile cover over the probe without manual contamination of the exterior of the cover.

3,650,154
THERMOCOUPLE INPUT TEMPERATURE SENSING CIRCUITRY

Charles J. Arnett, Union, and James M. Hoover, New Carlisle, both of Ohio, assignors to Instrulab, Inc., Dayton, Ohio

Filed Feb. 25, 1970, Ser. No. 13,998
Int. Cl. G01k *7/12*
U.S. Cl. 73—361 **5 Claims**



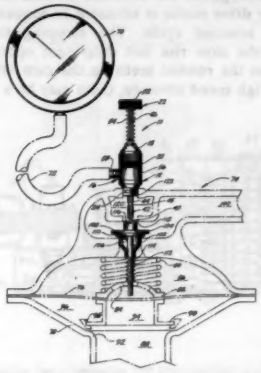
Voltage sensing circuitry for use with a thermocouple having a voltage output which is related to the temperature thereof. The thermocouple output voltage is compared with a reference voltage and the difference is amplified. The reference voltage varies with ambient temperature in order to null out the effects of temperature change on the cold junction of the thermocouple circuit, the cold junction being disposed within the same region as that in which the temperature indicating circuitry is disposed. The differential voltage between the thermocouple output voltage and the reference voltage is amplified by a single-ended amplifier so that the output of the thermocouple has low impedance to a conductor which is common to a power supply, to the reference voltage, and to output receiver means. Thus, the circuitry has high common mode rejection, i.e., there is insignificant effect upon the output voltage of the circuitry if the thermocouple comes into contact with an external voltage.

3,650,155
IDLE ADJUSTING TOOL

Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.

Filed Aug. 25, 1970, Ser. No. 66,817
Int. Cl. G01l *19/00*
U.S. Cl. 73—359 **9 Claims**

An idle adjusting tool has a body adapted for mounting on a fuel-air mixer with a bore of the body opening into a fuel passage of the mixer. A spring biases a screwdriver blade, received in the bore, away from an idle adjusting screw of the mixer. Upon displacing the screwdriver blade against the force of the spring, it is possible to engage the idle adjusting screw. Gas pressure communication between the fuel passage

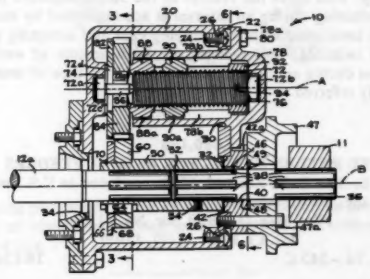


and a pressure gauge connected to the tool exists through the bore.

3,650,156
ADJUSTABLE STOP FOR INPUT SHAFT

David Carl Thomas, Jenkintown, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed May 20, 1970, Ser. No. 39,941
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.2 **8 Claims**



The number of revolutions imparted to a device such as a valve is limited by a mechanism utilizing intermittent gearing between an input shaft and an adjacent threaded shaft. As the threaded shaft is intermittently turned in response to rotation of the input shaft, travelling nuts on the threaded shaft move axially thereon between positive stops at which the threaded shaft and the input shaft are halted from further rotation.

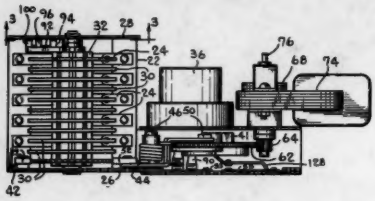
3,650,157
TIMER

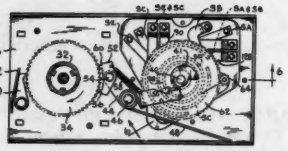
Donald M. Strathearn, Arlington Heights; James M. Thornbery, Morton Grove, and Dale F. Willcox, Aurora, all of Ill., assignors to Controls Company of America, Melrose Park, Ill.

Continuation-in-part of application Ser. No. 55,899, Sept. 14, 1960, Original application Mar. 16, 1959, Ser. No. 779,780, now Patent No. 2,995,143. Divided and this application Jan. 26, 1970, Ser. No. 10,690
Int. Cl. F16h *29/00*
U.S. Cl. 74—122 **5 Claims**

Depressing one of the cycle selection switches sets up a circuit through the shaded pole motor to drive the timer at high speed until the wiper on the end of the cam arbor finds an open circuit on the printed circuit board. During the high

speed advance of the timer, the machine circuits are de-energized and, upon finding the open circuit, the shaded pole motor is de-energized, the machine circuits are energized, and the timer drive motor is actuated to sequence the timer through the selected cycle. The stepping mechanism is operated by the slow rise fast drop cam operating a pawl which engages the ratchet teeth on the cam arbor. Particularly during high speed advance, there may be a tendency for





the arbor to overstep and, therefore, the pawl, in effect, is a double pawl or verge which jams two teeth at the conclusion of a step. This locks the ratchet in the step-completed position. Switching during an interval is accomplished by means of cams associated with the stepping cam and actuating subinterval switches. This enables the performance of various functions during an interval of the timer. This type of timer is generally referred to as a power timer.

3,650,158

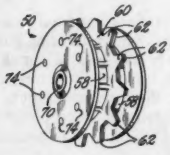
FEED RETURN WHEEL FOR ANIMAL FEEDERS

Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed May 28, 1970, Ser. No. 41,254

Int. Cl. F16h *55/30, 55/00*

U.S. Cl. 74—243 C **18 Claims**



A feed return wheel having a feed compacting surfac a chain-engaging sprocket, the sprocket being formed tegrally with the surface and the surface being provided with spaced raised protrusions for positively engaging returned feed to cause the latter to mix with fresh feed.

3,650,159

COMPOUND HYDROSTATIC TRANSMISSION

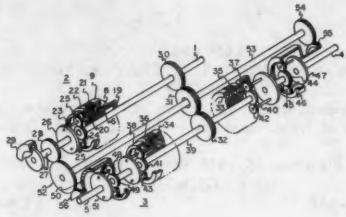
Sanford C. Cockrell, Wyoming, Ohio, and Robert J. Dorgan, Elnora, N.Y., assignors to General Electric Company

Filed Sept. 25, 1970, Ser. No. 75,554

Int. Cl. F16h *37/06, 5/42;* **B60k** *21/00*

U.S. Cl. 74—720.5 **15 Claims**

A compound hydrostatic transmission wherein a speed increaser transmission is added to a steering transmission, the steering transmission including end planetaries whose sun gears are driven by one source from the speed increaser transmission and whose ring gears are capable of being braked or being driven by another source from the speed increaser transmission in producing low speeds with heavy



torque and high speeds with lower torques, respectively, the steering transmission, in between the end planetaries, having infinitely variable hydrostatic means and being capable of driving the end planetaries at the same speeds or at different speeds in a steering operation departing from the straightaway.

3,650,160

DRIVING CONNECTION CONTROL SYSTEM

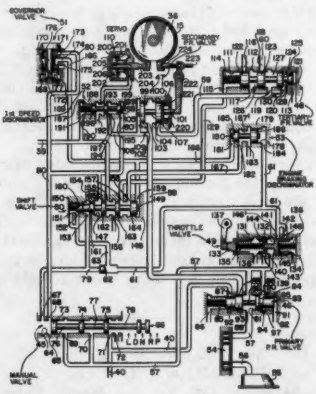
Toshio Higuchi, Suita-shi; Hideyuki Miyabe, and Takeo Hiramatsu, both of Kyoto-shi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Minato-ku, Tokyo, Japan

Filed Sept. 25, 1969, Ser. No. 860,864

Claims priority, application Japan, Sept. 28, 1968, 43/69971

Int. Cl. F16h *5/42, 3/74;* **B60k** *21/10*

U.S. Cl. 74—752 **7 Claims**

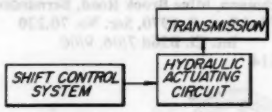


An automatic transmission comprises a hydraulic torque converter, a clutch unit and a planetary gear unit. The clutch unit is provided with a braking unit. Hydraulic pressure corresponding to the reaction torque of the braking unit is produced and used for engaging the braking unit.

3,650,161
AUTOMATIC SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Shin Ito; Seitoku Kubo, and Takakazu Mori, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed June 2, 1970, Ser. No. 42,753
Claims priority, application Japan, Oct. 18, 1969, 44/83411
Int. Cl. B60k *21/00;* **F16h** *5/06, 5/42*
U.S. Cl. 74—866 **9 Claims**

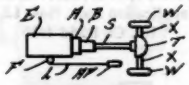


An automatic shift control system for a fluid controlled automatic transmission for a vehicle including a manual valve having a first position for establishing a relatively high forward drive ratio and a second position for establishing a relatively low forward drive ratio, a shift valve for controlling a plurality of fluid passages leading to brake bands and clutches from the manual valve to control the operation of the brake bands and clutches, and a solenoid for controlling the operation of the shift valve so that, in the first position of the manual valve, a low and a high forward drive ratio are obtained respectively, depending on the energization and de-energization of the solenoid, while in the second position of the manual valve, a low and a high forward drive ratio are obtained respectively which is dependent on the de-energization and energization of the solenoid.

3,650,162
HYDRODYNAMIC TRANSMISSION

Maurice B. Leising, Clawson, and Howard L. Benford, Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 22, 1969, Ser. No. 887,019
Int. Cl. B60k *21/00;* **F16d** *51/06;* **F01b** *7/20*
U.S. Cl. 74—867 **7 Claims**



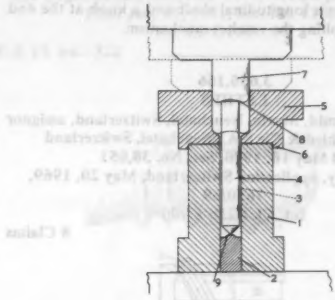
Automatic power transmission having gearing adapted to be connected in different modes to produce different driving ratios. A hydraulic control circuit is provided with a kickdown servo unit having two pistons. The circuit also includes a control valve for 1-2 shifting of the transmission.

3,650,163
PUNCHES

Christopher Paul Juffs, Toton, England, assignor to I Holland Limited, Long Eaton, Nottingham, England

Filed June 8, 1970, Ser. No. 44,028
Claims priority, application Great Britain, June 7, 1969, 28,918/69
Int. Cl. B21k *5/20*
U.S. Cl. 76—107 R **9 Claims**

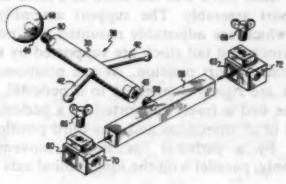
The tool steel bar which is to form the punch is placed within the oversized cavity of the hollow die and is thereafter deformed under the action of the shaped die slide member. The cavity is provided with a plug having a formed upper surface so as to impart a predetermined configuration to the head of the punch, for example, for impressing a signature or other identification into subsequently formed tablets.



3,650,164
PACKING REMOVAL

George M. McInvale, 164 Little John Drive, Pascagoula, Miss.

Filed Oct. 30, 1967, Ser. No. 678,868
Int. Cl. B25b *27/14*
U.S. Cl. 81—8.1 **2 Claims**

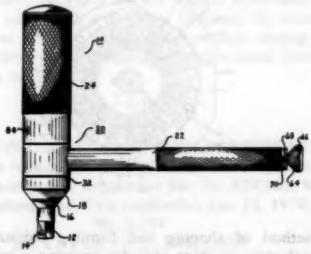


Prying packing rings out of a cavity by sequential use of an array of claw tools having a carrot shape and differently-curved tips.

3,650,165
RATCHET TOOL

Paul W. Wolfe, R.R. #1, North Webster, Ind.

Filed Nov. 21, 1969, Ser. No. 878,661
Int. Cl. B25b *13/46, 13/00*
U.S. Cl. 81—63.2 **4 Claims**



A ratchet tool having a radial handle operatable in either direction and adapted to be placed in a neutral position, and an axial handle which can rotate in either direction when the

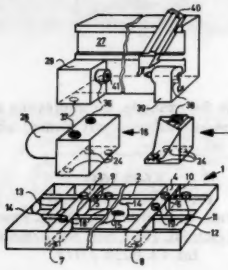
radial handle is in its neutral position and in the effective direction of the radial handle when the latter handle is in operating engagement with the ratchet mechanism. The radial handle contains a longitudinal shaft and a knob at the end thereof for controlling the ratchet mechanism.

3,650,166

LATHES

Ernest Jakal Schmid, Marin, Neuchatel, Switzerland, assignor to Edouard Dubied & Cie S.A., Neuchatel, Switzerland

Filed May 18, 1970, Ser. No. 38,051
Claims priority, application Switzerland, May 20, 1969, 7650/69
Int. Cl. B23b *17/00*
U.S. Cl. 82—32 **8 Claims**



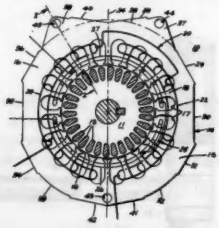
The bed head stock and tail stock of a lathe are supported on a support assembly. The support assembly includes a frame on which are adjustably mounted two pedestals. The bed head stock and tail stock are supported by the pedestals at three spaced-apart position. At one position the bed and head stock are rigidly connected to a pedestal, at a second position the bed is freely supported by a pedestal for sliding movement in all directions and at a third position the bed is supported by a pedestal for sliding movement in one direction only, parallel with the longitudinal axis of the lathe.

3,650,167

METHOD OF MANUFACTURING MAGNETIC LAMINATIONS FOR DYNAMOELECTRIC MACHINE

William R. Hoffmeyer, Holland, and Alvin L. Rediger, Zeeland, both of Mich., assignors to General Electric Company

Original application July 9, 1969, Ser. No. 840,188, now Patent No. 3,588,561. Divided and this application July 2, 1970, Ser. No. 52,014
Int. Cl. B26d *3/00*
U.S. Cl. 83—41 **5 Claims**



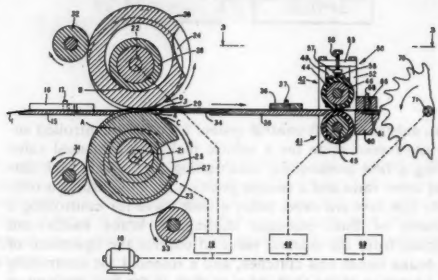
A method of shaping and forming laminations for a dynamoelectric machine includes severing a number of individual laminations in nested relationship from a single strip of magnetic material. Also disclosed is a dynamoelectric machine stator core of stacked laminations. The core includes a yoke section, a bore inside the yoke section and winding receiving slots extending inwardly from the yoke section. A first mounting opening is formed in the core outside the slots while second and third mounting openings are formed in core material radially outward of the yoke section. The angular distance between the first mounting opening and each of the second and third mounting openings is greater than the angular distance between the second and third mounting openings.

3,650,168

OPERATING UPON STRIPS OF THIN MATERIAL

Henry F. Ruschmann, Mine Brook Road, Bernardsville, N.J.

Filed Sept. 8, 1970, Ser. No. 70,220
Int. Cl. B26d *7/06, 9/00*
U.S. Cl. 83—114 **4 Claims**



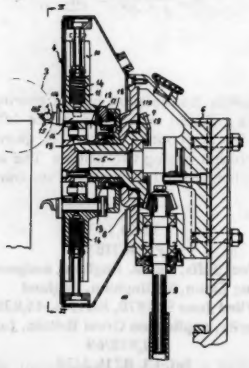
A rotary slitter, for slitting a strip of thin material into narrower ribbons and establishing the speed of travel of those ribbons, is provided with output-disengaging means of dynamic nature, moved by and with the elements of the slitter, enabling the minimization of tension on the exiting ribbons. A pair of ribbon-engaging rollers, driven at a peripheral speed slightly greater than the speed of travel of the ribbons, receives the ribbons from the slitter in side-by-side relationship and under slight tension. From the rollers the ribbons may optionally pass to an anvil member with which a cutter cooperates to cut the ribbons into discrete small pieces.

3,650,169

CIGARETTE ROD CUTOFF DEVICE

Goffredo Gianese, Bologna, Italy, assignor to AMF Incorporated

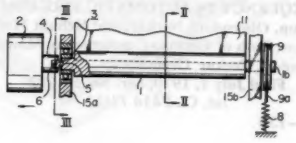
Filed Nov. 6, 1969, Ser. No. 874,457
Claims priority, application Italy, Nov. 12, 1968, 7468 A/68
Int. Cl. B26d *1/56*
U.S. Cl. 83—310 **3 Claims**



A cradle-shaped support for a continuous cigarette rod that is to be cut is driven continuously in one direction along a generally circular closed path that is tangential to the rod and at a peripheral speed equal substantially to the speed of

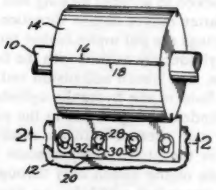
the rod to periodically support and guide the rod each time the rod is cut with a blade.

3,650,170
CUTTING DEVICE OF A COPY MACHINE
Satoshi Hisabayashi, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Sept. 29, 1970, Ser. No. 76,443
Claims priority, application Japan, Apr. 15, 1970, 45/35712
Int. Cl. B26d *1/56*
U.S. Cl. 83—349 **4 Claims**



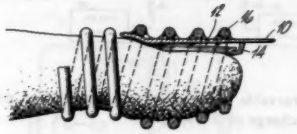
An improved cutting device of a copy machine provided with a counter mechanism which eliminates play between drive engagement of elements so that jamming of paper at each time of feeding a fresh piece of paper to the cutting position of the device can be completely eliminated and temperature elevation of drive means can be prevented.

3,650,171
ROTARY CUTTING DEVICE
Gaylard O. Reed, Portland, Oreg., assignor to Salem Equipment, Inc., Salem, Oreg.
Filed Dec. 3, 1969, Ser. No. 881,644
Int. Cl. B26d *1/20*
U.S. Cl. 83—355 **2 Claims**



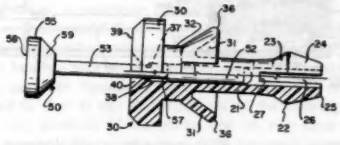
A rotary head mounts a straight cutter blade the working edge of which intercepts the plane of an associated flat anvil to form an acute included angle. The anvil is provided with a longitudinally concave working edge which is contiguous to the working edge of the blade uniformly throughout their cooperative lengths, and preferably with a longitudinally concave and transversely sinusoidal working face, the opposite longitudinal edges of which are reverse images of each other, whereby the anvil is reversible. This anvil construction is provided by traversing the working face with a rotary cutting tool which defines a cutting arc having the same radius as the rotational radius of the blade, with the intercepting planes of the anvil and direction of relative movement of the anvil and cutting tool being arranged to form the aforementioned acute included angle.

3,650,172
GUITAR PICK
Robert D. Osborne, Saltville, Va., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Jan. 27, 1971, Ser. No. 110,135
Int. Cl. G10d *3/16*
U.S. Cl. 84—322 **4 Claims**



A guitar pick comprising an artificial nail for picking securable by a nail chuck to a natural nail and held in place by a spiral thimble.

3,650,173
POSITIVE LOCKING SNAP-FASTENER
Istvan Mathe, Cicero, Ill., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Jan. 2, 1970, Ser. No. 237
Int. Cl. F16b *13/06*
U.S. Cl. 85—81 **7 Claims**

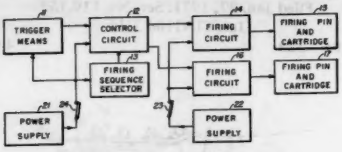


A snap-fastener of two parts, provided by pin and plug members, for retention within apertures of loose tolerance requirements. The pin member includes, at one end, a head with integral conical washer, and at the other end, a boss which has a slot for a closing of the boss together to pass through an aperture. The plug member is received within an axial bore through the pin and is slidable within the slot to spread the boss and an inward taper thereof against an aperture edge. As the boss spreads, the taper rides by the aperture edge to force the pin inwardly against resistance of the washer. Tension, provided by the washer resistance, urges the aperture edge against the taper to clamp the interior of the boss about the plug, which then prevents closing of the slot for a positively locked retention until manual removal of the plug from the slot.

3,650,174
ELECTRONIC IGNITION SYSTEM FOR FIREARMS
Thomas Sloan Nelsen, 616 Foothill Road, Sanford, Calif.
Continuation-in-part of application Ser. No. 820,932, May 1, 1969, now abandoned. This application Jan. 12, 1970, Ser. No. 2,274
Int. Cl. F41c *19/12*; F41f *13/08*
U.S. Cl. 89—28 **11 Claims**

An electronic ignition system for firing electrically primed ammunition in a firearm. The system includes a trigger for converting mechanical movement to electrical signals without the need of electrical contacts, and logic circuitry

which permits selective firing of multiple barrels with a single trigger. Various electrical and mechanical safety features, including retractable firing pins, are provided to prevent accidental discharge of the weapon.

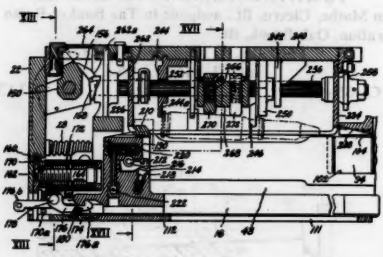


3,650,175

ROTARY SPROCKETED FEEDER FOR BELTED AMMUNITION

Richard H. Colby, Hamden, Mass., assignor to General Electric Company

Filed Apr. 7, 1969, Ser. No. 814,085
Int. Cl. F41d *9/02*
U.S. Cl. 89—33 CA **4 Claims**



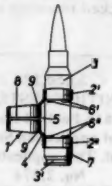
A machine gun is disclosed with a top located, recoil operated, two source feed mechanism with two, alternatively functional, spaced apart sprocket shaft assemblies disposed over an ammunition tray having a central aperture onto which the round to be chambered is delivered during recoil and held in place by springs, so that the round may be displaced vertically by the rammer of the bolt in recoil.

3,650,176

METAL BELT MEMBER FOR ARRANGING IN SERIES OF CARTRIDGES FOR RAPID FIRE ARMS

Gustav Lindner, Iserlohn, Germany, assignor to Firma Heinrich Hulter, Jr., Iserlohn, Germany

Filed Jan. 6, 1969, Ser. No. 789,234
Int. Cl. F42b *39/08*
U.S. Cl. 89—35 A **2 Claims**



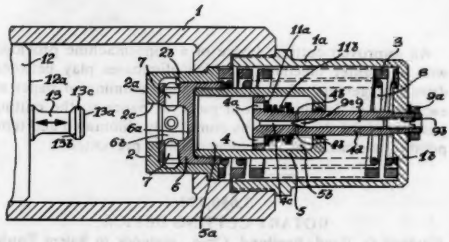
A metal belt member for aligning of cartridges on belts for rapid fire weapons which comprises two resilient loops open towards the same side. One of the loops forms the center zone of the belt surrounding with play one of the cartridges, while the other of the loops formed in a pair clampingly surrounds the next adjacent of the cartridges. The other of the loops has a resilient tongue for entrance into a channelure of the cartridge and includes further angularly bent wings, projecting from the marginal edges of the two loop parts forming the loop in pairs and defining a slot therebetween. A rib extends in longitudinal direction of the cartridge belt and projects towards the inside of the loop out of the face of the loop and assumes the tensile stress of the belt, as well as being reduced towards its free end, all loops having slots oriented cross-wise to the longitudinal direction of the belt and aligned on one side of the belt spaced from and parallel to the longitudinal axis of the belt.

3,650,177

DEVICE FOR CONTROLLING THE FIRING FREQUENCY IN AUTOMATIC FIREARMS

Gerhard Hupp, Oberndorf, Neckar, and Helmut Mader, Rottweil, Neckar, both of Germany, assignors to Mauser-Werke AG, Oberndorf, Neckar, Germany

Filed July 1, 1970, Ser. No. 56,012
Int. Cl. F41d *11/12*
U.S. Cl. 89—130 **4 Claims**



A device for changing the firing frequency of rapidly firing automatic firearms in which a buffer case attached to the housing of the firearm contains a buffer spring urging the head of the buffer case into the housing of the reciprocating breech block. A hydraulic cylinder is surrounded by a recoil spring and the latter is disposed within the buffer spring and has a cylinder head arranged within the buffer head. A number of radially slidable locking pins in the cylinder head is adapted to be locked to an axial locking bolt on the breech block when the latter moves in one direction in which the two mentioned springs are put under higher tension while the buffer head and cylinder are moved with the breech block in the same direction. The piston and piston rod are stationary and the pressure fluid in the hydraulic cylinder is displaced by the moving cylinder through bores in the piston from one side to the other side thereof until an axially slidable seal closes the bores in the piston. The pressure fluid can now return the one side of the piston only through radial throttling bores in the piston rod which has an axial bore extending through the center of the piston and this causes a delay in the return of the breech block in the other direction.

Preferably, an axially adjustable needle valve in the piston rod controls the discharge ends of the radial bores into the axial bore of the piston rod and permits a predetermined continuous change in the firing frequency of the firearm down to a very low number of shots per minute.

3,650,178

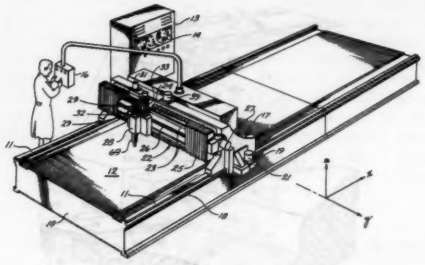
MULTI-PURPOSE MULTI-MOTION MACHINE TOOL

Joe S. Appleton, 1865 West 120th, Los Angeles, Calif.

Filed Jan. 8, 1970, Ser. No. 1,465
Int. Cl. B23c *1/06*
U.S. Cl. 90—15 **15 Claims**

A gantry type of milling machine capable of traversing in x, y and z directions over a large work table or bed and tilting about the x and y axes is described. The y direction tilt is

provided by pivoting a crossbeam extending across the gantry by means of a worm and sector. The crossbeam is supported at its ends by thrust bearings so as to be in tension for minimized weight. A saddle mounted on the crossbeam supports a tool holder pivotable about the x direction which may



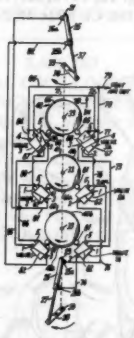
be employed for conventional milling tools, grinding tools, or the like or for a special tape laying apparatus for laying boron filament tapes or the like on the machine bed, or a workpiece thereon. The tool is indexable and may be pivotable in the z direction.

3,650,179

COMPRESSED GAS OPERATED ENGINE

Joseph D. Stenger, 458 Eighth St., Brooklyn, N.Y.

Filed May 28, 1970, Ser. No. 41,418
Int. Cl. F01b *15/04*
U.S. Cl. 91—176 **6 Claims**



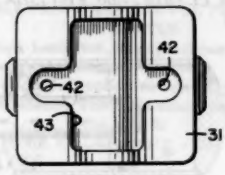
This engine is operated by compressed gas and comprises two cylinders with pistons therein, on piston rods that are pivoted to cranks fixed to a control shaft. This shaft carries a gear meshing with direction reversible gearing. The shaft also carries cams for operating valves that connect opposite ends of the cylinders to compressed gas supply and to vent. Means is provided to block off the compressed gas supply and vent to both ends of each cylinder and to interconnect both ends of each cylinder, to permit one cylinder to be under power while the piston in the other cylinder idles and is dragged by the piston in the powered cylinder. Both cylinders are never devoid of power at the same time.

3,650,180

COMPOUND HYDROSTATIC BEARING FOR ROTARY RADIAL PISTON HYDRAULIC MACHINES

Gottfried K. Gantschnigg, and Richard F. Wameling, both of Annapolis, Md., assignors to Arinc Research Corporation, Annapolis, Md.

Filed Sept. 30, 1969, Ser. No. 862,293
Int. Cl. F01b *13/06*
U.S. Cl. 91—488 **4 Claims**



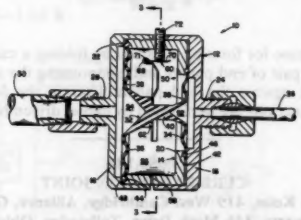
A compound hydrostatic bearing for use in radial piston machines, such as hydraulic motors, pumps, transmissions and the like which operate at high speeds and under high fluid pressures comprising a bearing race which reacts the radial piston forces and rotates free with the cylinder block on a pressurized fluid film in the stationary housing. Swivel mounted pads, at the top of the pistons, transmit the radial forces of the pistons in the bearing race and adjust themselves for misalignment due to housing displacement. Friction between the pads and the bearing race provide the force to rotate the race with the cylinder block. Pressurized fluid is supplied through passages in each piston to a recess on top of the associated pad. The size of the recess is equal to the cylinder area, and therefore the force due to the pressure in the recess is a reacting force from the pressure in the cylinder. Pressurized fluid from the pad recess is then supplied through orifices to recesses at the outer side of the multirecess bearing ring providing pressurized lubrication to the bearing surfaces. Spacing of the race orifices and recesses is arranged so that at any displacement of the bearing housing and at any position of the pads, one or two race recesses communicate with a pad recess. The size and location of a recess is selected to react and damp bearing loads with the pressurized lubricating fluid.

3,650,181

CONTROLLER RESPONSIVE TO VARIATION IN PRESSURE IN ONE SOURCE FOR VARYING PRESSURE IN ANOTHER SOURCE

Edward L. Parr, El Cajon, Calif., assignor to Wendell L. Thompson, Burbank, Calif.

Filed Mar. 27, 1970, Ser. No. 23,195
Int. Cl. F01b *19/00*
U.S. Cl. 92—48 **9 Claims**



A controller having an integral element including two flexible diaphragms forming, with a casing, two separate chambers, one of the diaphragms having a larger pressure-subjected area than the other. One of the chambers is connected

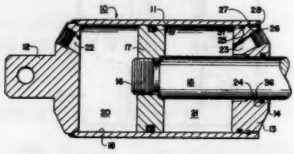
to a motivating source of fluid and the other is connected to a motivated source of fluid. A spring is connected to one of the diaphragms and the force of the spring is controlled.

3,650,182

CLOSURE FOR FLUID PRESSURE VESSEL

John F. Phillips, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Sept. 17, 1969, Ser. No. 858,801
Int. Cl. F01b *29/00;* **F16j** *13/14*
U.S. Cl. 92—128 **12 Claims**



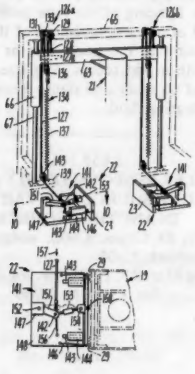
A mechanical joint for securing the head or bearing end of a linear hydraulic cylinder to the barrel. A fastening member axially secures the end member to the barrel and forms an interference fit therewith to cause slight radial deflection of the barrel or end member, which then acts as a spring to radially load the barrel and end member together. A tapered surface is included on the end member to facilitate assembly and disassembly of the fastening member.

3,650,183

CARTON FORMING MACHINE

Charles D. Striplin, Box 515, Benica, Calif.

Filed June 24, 1970, Ser. No. 49,293
Int. Cl. B31b *1/54, 1/62, 7/02*
U.S. Cl. 93—36.3 **3 Claims**



A machine for forming a carton by folding a carbon blank around a pair of end panels and compressing the side tabs of the blank against the end panels wherein the feeding and folding functions are performed by cables driven by the ram.

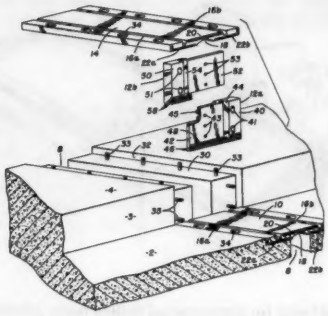
3,650,184

CURB EXPANSION JOINT

Ernest L. Kolm, 419 West Cambridge, Alliance, Ohio; Roger P. Schwartz, 346 Mark Drive, Tallmadge, Ohio, and John A. Welch, 197 Chart Road, Cuyahoga Falls, Ohio

Filed Aug. 18, 1970, Ser. No. 64,712
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **13 Claims**

A curb expansion joint is used in combination with a shear-type elastomeric expansion joint to seal the expansion slot extending across a bridge or similar structure. The expansion slot allows for relative movement of the various components of the bridge caused by thermal expansion and contraction. The curb expansion joint is typically fabricated in two sections. Each section comprises a first portion which is fastened to the curb by studs or the like, and a second portion comprising a wing extending laterally outwardly from the first



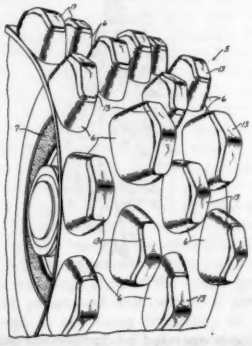
portion in overlapping engagement with the wing portion of the other section. The two sections are bolted or otherwise secured together, and when assembled, contain vertical expansion grooves which permit the assembled joint to expand and contract jointly with the bridge deck expansion joint. A suitable cement can be used to form a waterproof seal between the bridge expansion joint and the curb expansion joint.

3,650,185

FOOT FOR COMPACTING ROLLER

Harry H. Takata, Golden Valley, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Aug. 12, 1970, Ser. No. 63,075
Int. Cl. F01c *19/23*
U.S. Cl. 94—50 PR **12 Claims**



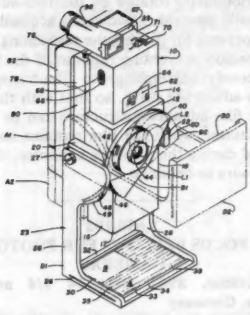
An earth compacting roller having toothlike feet projecting from its cylindrical surface, the feet being arranged in circumferentially and axially spaced staggered relationship and the feet having an elliptical cross section with the major axis of the ellipse normal to the roller axis and the surfaces of the feet so shaped that the leading and trailing edge surfaces of at least the base portions of the feet are defined by curved lines that are substantially involutes generated from a base circle the radius of which is no larger than that of the cylindrical surface of the roller.

3,650,186

CAMERA PROVIDING EXPOSURES OF MULTIPLE AREAS OF A PHOTOGRAPHIC MEDIUM

Lionel L. Stelck, Motley, Minn., assignor to Multi-Photo Camera Corporation, Eden Prairie, Minn.

Filed Aug. 3, 1970, Ser. No. 60,362
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 10 Claims



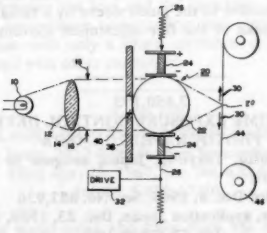
A camera assembly for making a composite photograph of different images positioned at different predetermined areas of a light sensitive medium comprising a camera body having a lens carrier rotatably disposed on its front wall; a vertically movable film holder at the rear of the camera body and a data card holder rotatably mounted at the sides of the camera body and coupled to the lens so that when the card holder is raised the lens shifts laterally. The film holder is adapted to be shifted vertically to a different position for producing another composite photograph. A lamp for illuminating the object being photographed is inside the camera body. The level of illumination is automatically varied upon operation of a switch by the lens carrier when it is rotated. Another switch is provided for switching between external and internal power supplies for the lamp.

3,650,187

PHOTO-OPTICAL OSCILLOGRAPH AND HIGH FREQUENCY SOUND RECORDER

Herbert Judin, Dix Hills, N.Y., assignor to Areoptix Technology Corporation, Plainview, N.Y.

Continuation-in-part of application Ser. No. 727,384, Feb. 26, 1968, which is a continuation-in-part of Ser. No. 41,763, June 3, 1970, which is a Division of Ser. No. 419,512, Dec. 18, 1964, now Pat. No. 3,379,832
Int. Cl. B41b *19/00*
U.S. Cl. 95—4.5 19 Claims



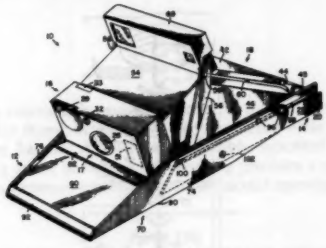
An oscillating ball that is piezo-electrically driven, or by other electrical means or by acoustical control caused to oscillate upon application of impulses so that by using the rotatable or oscillating member electrical treatment of optical energy is achieved, the oscillation being sufficiently rapid to achieve undulation for recording audio signals, called "optical sound," upon a recorder such as a film strip or the like. When a laser beam input is employed directly on the oscillating ball, a new printing mode is at hand. The vibrating ball is a small miniature spherical lens system forming the microprojection system, such as the balls that are disclosed in Judin U.S. Pat. No. 3,379,832 and other Judin patent applications.

3,650,188

DETACHABLE FILM CHAMBER FOR PHOTOGRAPHIC APPARATUS

James M. Whall, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 803,629, Mar. 3, 1969, now abandoned. This application June 26, 1970, Ser. No. 50,240
Int. Cl. G03b *19/10, 17/52*
U.S. Cl. 95—11 R 17 Claims



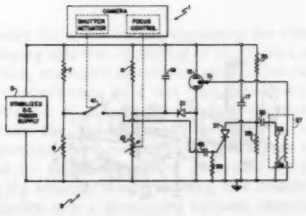
A camera of the self-developing type including an enclosure or chamber coupled to the camera for movement between a compact, inoperative position wherein at least a portion of the chamber is located against a wall of the camera and an extended, operative position in which it forms an extension of the camera and is adapted to receive an exposed film unit as it exits from the camera. The camera includes a pair of rolls for advancing an exposed film unit into the chamber. A switch is located between a source of power and the rolls and is adapted to be closed by movement of the chamber into the extended, operative position thereby insuring that the chamber is in position to receive the exposed film unit prior to the exposed film unit being moved out of the camera.

3,650,189

LOW ENERGY LEVEL ELECTRONIC FLASH MODULATOR

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 28, 1969, Ser. No. 880,795
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 R 10 Claims



A device is provided for modulating actinic radiation emanating from a gas discharge lamp in response to the focus setting of a camera.

Plural energy storage sources are provided with one such source having relatively low storage capacity and storing energy of sufficiently high potential to fire the lamp in response to a trigger signal.

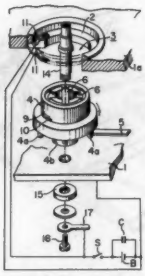
Another source, having a relatively high capacity for storing energy of a potential sufficient to maintain a discharge from said lamp, but insufficient for initiating such discharge with an acceptable frequency of success, is provided.

3,650,190

CAMERA HAVING BUILT-IN SOCKET FOR FLASHCUBES OR OTHER FLASH APPARATUS

Fumihiro Miyagawa, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed June 18, 1969, Ser. No. 834,393
Claims priority, application Japan, June 20, 1968, 43/52035
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 R **4 Claims**



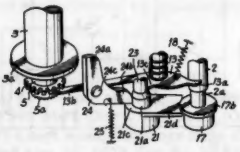
A camera having a built-in flash synchronization socket for flashcubes in which a post disposed at the center of said socket for guiding the insertion of the flashcubes into the socket comprises two electrically insulated outer and inner tubes so that a connector of a flash cord or cable of an ordinary type flashbulb holder may be electrically connected to said two tubes which in turn are electrically connected to a flash synchronization switch operable in response to the shutter operation. Not only the flashcubes but also ordinary large-sized flashbulbs may be used.

3,650,191

CAMERA FOR MAKING MULTIPLE EXPOSURES

Katsuhiko Nomura, Kawagoe; Koichiro Watanabe, and Fumio Urano, both of Tokyo-to, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 20, 1971, Ser. No. 107,885
Claims priority, application Japan, Jan. 26, 1970, 45/6266
Int. Cl. G03b *15/00, 17/42*
U.S. Cl. 95—31 R **10 Claims**



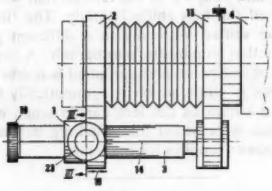
A camera capable of making multiple exposures. The camera includes a rotary film spool on which film is wound as well as a film-transporting element for transporting film in the camera. A film advancing mechanism is actuated in order to advance film and cock the shutter, and this latter mechanism frictionally engages the film spool to transmit rotary movement thereto frictionally. The film-transporting structure is capable of being coupled to and uncoupled from the filmeadvancing mechanism, and a restraining member is provided to be displaced from a non-restraining position to a restraining position engaging the spool to prevent the latter from being frictionally rotated by the film-advancing structure. A manually operable structure is accessible to be actuated by the operator for placing the restraining member in its restraining position preventing rotation of the film spool and for simultaneously uncoupling the film-transport structure from the film-advancing drive, so that with the parts in this condition the film-advancing structure can be actuated only to cock the shutter, while the film remains stationary in the position it had during the previous exposure, thus enabling a multiple exposure to be made.

3,650,192

FOLLOW FOCUS BELLOWS FOR PHOTOGRAPHIC CAMERAS

Ferdinand Kellner, 8941 Hart 14 1/4 near Memmingen/Bavaria, Germany

Filed Mar. 17, 1969, Ser. No. 807,808
Claims priority, application Germany, Apr. 6, 1968, P 17 72 163.0
Int. Cl. G03b *3/02*
U.S. Cl. 95—45 **8 Claims**



A focusing means for a bellows-type photographic camera, having both coarse and fine adjustment means. An outer guide sleeve is longitudinally movable relative to a stationary central spindle by means of a fine-adjustment screw thread; the forward end of the bellows includes a sliding carriage which may be slidably movable longitudinally relative to the guide sleeve for coarse adjustment, and which may be selectively locked relative to the guide sleeve by a radial set-screw to thereby partake of the fine-adjustment movement of the sleeve.

3,650,193

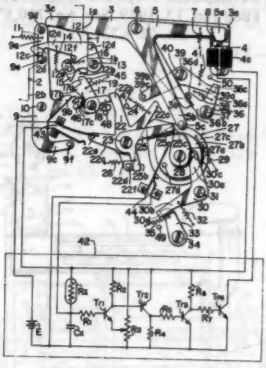
BULB AND TIME EXPOSURE CONTROL DEVICE FOR PHOTOGRAPHIC CAMERA

Munetaka Shimizu, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu

Filed Dec. 8, 1969, Ser. No. 882,936
Claims priority, application Japan, Dec. 23, 1968, 43/94379
Int. Cl. G03b *7/08*
U.S. Cl. 95—53 EB **8 Claims**

An electronically controlled camera shutter of the type in which exposure time is automatically controlled by an electronic circuit, in which the power switch of said circuit is controlled so as not to close when the shutter is set to

operate for either bulb exposure or time exposure, whereby bulb and time exposures are performed by only mechanical



elements of the shutter, by passing the electronic circuit, whereby use of the power source battery can be minimized.

3,650,194

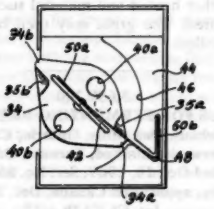
DISPOSABLE CAMERA

Penick Ib, New York, N.Y., assignor to Simpro Corporation of America, County of Bergen, N.J.

Filed Apr. 16, 1969, Ser. No. 816,499

Int. Cl. G03b *9/20*

U.S. Cl. 95—61 **7 Claims**



A camera comprising the combination of a box camera which is open on one side, and a self-contained film cartridge which is detachably secured to the camera to close its open side and thereby form a light tight enclosure. The camera has a photographic lens to expose the film in said cartridge, and a spring-urged apertured diaphragm shutter which is rotatably mounted between the lens and the cartridge. The camera is of simple, inexpensive construction and may be discarded following use with only a single cartridge, or it may be repeatedly used with other cartridges.

3,650,195

FLASH ADAPTER FOR PRESS CAMERA

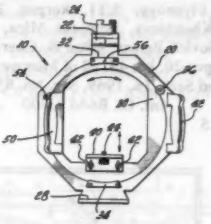
Richard B. Jones, 2932 Belle St., San Bernardino, Calif.

Filed Apr. 25, 1967, Ser. No. 633,527

Int. Cl. G03b *17/56*

U.S. Cl. 95—86 **3 Claims**

Light cast metal outer and inner rings, the opening in the latter being about 8 inches in diameter, said inner ring journaling in said outer ring, for ready coaxial rotation therein. Two vertical horizontally diametrically opposed handles are provided, each being fixed to one of said rings, said handles being simultaneously gripped by the right and left hands in supporting the adapter and rotating said inner ring in said outer ring. Said inner ring supports a camera in its opening. The top of said outer ring rockably supports a flasher unit pivoted thereon on a transverse axis. A cable shutter release is thumb actuatable by a hand gripping one of said handles. A device locking said inner ring against rotation, and while



variously rotationally positioned, relative to said outer ring is located for thumb actuation by the other hand while gripping the other handle. A platform adjustably mounted on said inner ring at the bottom of said opening provides a rigid support for a camera variously positioned in said opening.

3,650,196

DEVICE FOR AUTOMATICALLY REGULATING THE CONCENTRATION OF DEVELOPING SOLUTION

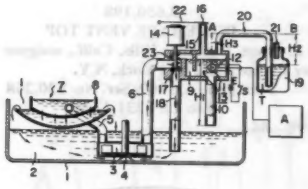
Kazuya Hosoe, and Yoshimasa Kimura, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1969, Ser. No. 868,791

Claims priority, application Japan, Nov. 5, 1968, 43/80779

Int. Cl. G03d *3/00*

U.S. Cl. 95—89 R **8 Claims**



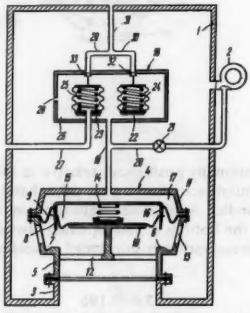
A device for automatically regulating the concentration of a developing solution, consisting of toner dispersed in a carrier solution, maintains developing solution having a predetermined concentration in a wet type developing device. The concentration of the solution is photoelectrically detected, and, when the concentration decreases to less than the predetermined valve concentrated toner from a container is supplied by negative pressure generated by the falling of developing solution then remaining in a concentration regulating device into a developing solution reservoir under the action of gravity. Such concentration adjustment occurs in response to the interruption of the circulation of the solution and disconnection of the concentration regulating device from the surrounding atmosphere.

3,650,197

APPARATUS FOR CONTROLLING AIR PRESSURE INSIDE THE CABIN OF AN AIRCRAFT

Grigory Ivanovich Voronin, Ploschad Vosstania, 1, kv. 447; Mikhail Ivanovich Vzorov, 1 ulitsa Yamskogo polya, 24, kv. 34; Ilya Lvovich Karasik, ulitsa Festivalnaya, 14, korpus 2, kv. 318; Jury Dmitrievich Lyagushkin, ulitsa Lavochkina, 48, korpus 2, kv. 496; Leonid Yakovlevich Perepletchikov, ulitsa Dm. Ulyanova, 9/11, korpus 2, kv. 42; Nina Dmitrievna Khokhlova, Prospekt Mira, 45, kv. 12, and Jury Mikhailovich Petrov, ulitsa B. Cherkizovskaya, Kvartal 8/11, korpus 20, kv. 44, all of Moscow, U.S.S.R.

Filed Sept. 16, 1969, Ser. No. 858,435
Int. Cl. B64d *13/00*
U.S. Cl. 98—1.5 1 Claim



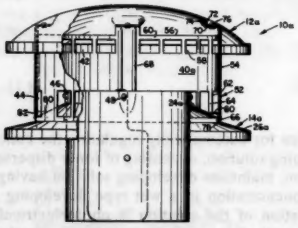
An apparatus for controlling air pressure inside the cabin of an aircraft, the cabin being provided with a means for supplying pressurized air thereinto and an air-operated valve, installed in the path of communication of the cabin with the atmosphere and controlled by a governor, the valve being so adapted to open in case there is no control signal and to close under the action of this signal.

3,650,198

DOME TYPE VENT TOP

Richard L. Stone, Los Altos Hills, Calif., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed June 4, 1969, Ser. No. 830,268
Int. Cl. F231 *17/02*
U.S. Cl. 98—84 3 Claims



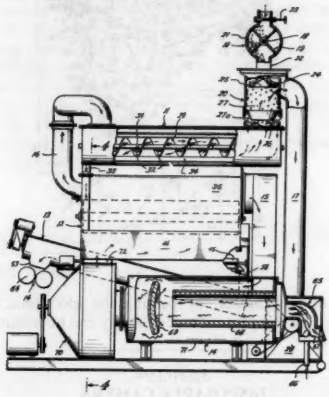
A dome type top or terminal device for vent or flue pipes comprising a dome-shaped sheet metal top member vertically spaced from and connected by supporting legs with a skirt having substantially the same diameter. An intermediate air flow divider member is fixed to the supporting legs and provides upper and lower cylindrical discharge openings which can be optimized for maximum air flow efficiency.

3,650,199

MATERIAL TREATING APPARATUS

Norman H. Sachnik, San Angelo, Tex., assignor to Range Engineering Development Corp., San Angelo, Tex.

Filed Jan. 13, 1969, Ser. No. 790,577
Int. Cl. A23l *1/18*
U.S. Cl. 99—235 R 14 Claims



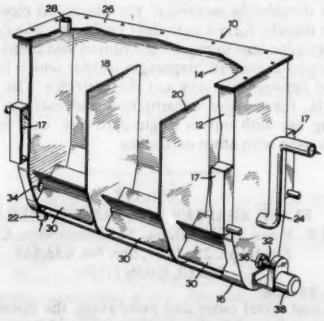
This patent discloses a method and apparatus for treating material such as grain, manure, alfalfa, lightweight aggregate, etc. Hot air circulates throughout the entire system. Heat is first added where desired to the product in a preheater. Additional heat is then added in a heater section where the material is further heated and material such as grain may be popped if desired. The grain may then be passed through conventional rollers.

3,650,200

APPARATUS FOR FERMENTING BREWER'S WORT

Orland Otto Schaus, Don Mills, Ontario, Canada, assignor to Canadian Breweries Limited, Toronto, Ontario, Canada

Filed Oct. 10, 1969, Ser. No. 865,238
Claims priority, application Canada, Dec. 30, 1968, 038922
Int. Cl. C12h *1/22*
U.S. Cl. 99—277.2 2 Claims



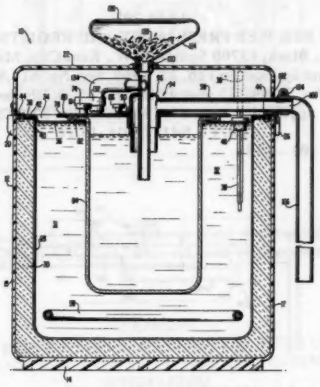
This invention relates to the manufacture of alcoholic brewery beverages on a continuous basis and is concerned with a novel fermenting vessel and novel fermentation process involving its use. The fermenting vessel has a series of compartments through which the brewer's wort flows in use. The bottom of the vessel has a rounded bottom in cross-

section and a longitudinally extending paddle rotates close to the rounded bottom at a slow rate sufficient only to keep yeast from settling on the bottom during the fermentation process. This limited agitation has been found to be as effective as the rapid agitation from a time point of view and produces end product that is superior in taste to one that is rapidly agitated.

3,650,201
TEA AND COFFEE BREWER

Dragomir M. Jovanovic, 17, Rue St. Michel, Lyon 7, France

Filed Sept. 3, 1969, Ser. No. 854,829
Int. Cl. A47j *31/00*
U.S. Cl. 99—279 **14 Claims**

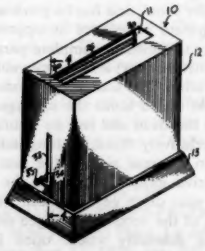


Disclosed is a brewer for brewing and dispensing coffee, tea, soup or the like. A brewing chamber is surrounded by a reservoir of hot water with the reservoir in fluid communication with a standpipe extending downwardly into the brewing chamber. A metered charge of cold water supplied to the reservoir drives a like amount of hot water from the reservoir into the standpipe where it is mixed with particles of coffee, tea or the like. The pressure head in the standpipe forces beverage mixed with particles out of the brewing chamber and this outflow of beverage is sustained and subsequently cutoff by a siphon effect to deliver a metered amount of beverage.

3,650,202
PORTABLE TOASTER

Veldon A. Monson, Box 128, Hammond, Wis.

Filed Aug. 13, 1969, Ser. No. 849,763
Int. Cl. A47j *37/08*
U.S. Cl. 99—391 **3 Claims**

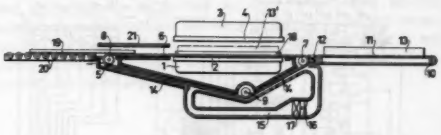


A housing having a generally upwardly directed slot therein for receiving a slice of bread, with rechargeable battery-powered heating elements therein for toasting a slice of bread inserted within said slot.

3,650,203
ARRANGEMENT IN HEAT PRESSES

Bengt J. Carlsson, and Mauritz R. G. Sundberg, both of Motala, Sweden, assignors to Aktiebolaget Motala Verkstad, Motala, Sweden

Original application Oct. 9, 1968, Ser. No. 766,175, now Patent No. 3,602,134. Divided and this application Nov. 12, 1970, Ser. No. 88,882
Claims priority, application Sweden, Oct. 19, 1967, 14346/67
Int. Cl. B02c *11/08*; B30b *15/34*
U.S. Cl. 100—93 P **7 Claims**

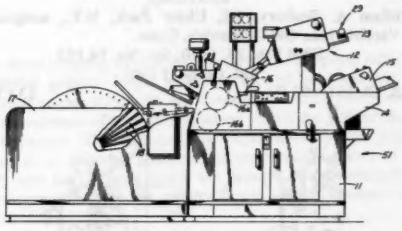


Apparatus for use in heat presses is provided and includes an endless conveyor belt drawn through a press opening between two hot plates. Goods to be pressed are placed on the upper part of the conveyor belt and the section of the conveyor belt receiving goods for immediate movement into the press is heated. Apparatus is provided for heating the conveyor belt and the goods thereon immediately prior to movement of the goods into the press for processing therein.

3,650,204
REPROGRAPHY MACHINE CONTROLLED BY INFORMATION ON MASTER

Jack E. Burger, Moreland Hills; Fritz A. Deutsch; Warren B. Howe, and William Kyle, all of Euclid, Ohio, assignors to Addressograph-Multigraph, Cleveland, Ohio

Filed Jan. 22, 1970, Ser. No. 5,035
Int. Cl. B41l *9/00*; G06k *17/00*
U.S. Cl. 101—45 **9 Claims**



Automatic control of reproduction and sorting of reproduced copies is accomplished in a printing or duplicating machine, a reprography machine, of the type which utilizes masters or originals from which copies are made and which has a hopper, magazine, bunker or chamber for masters, with provision for feeding them in succession to a cylinder associated with inking, duplicating and cleaning mechanisms. Masters are employed which are formed with indicia or coded markings along one or two edges which provide signals for causing a desired number of copies of each successive master to be produced and for sorting the produced copies in a desired manner, for example according to the number of copies to be sent to each of a plurality of different destinations. A scanner is provided for examining the code marks to produce signals, and circuits responsive thereto serve to actuate parts of the duplicating machine. A

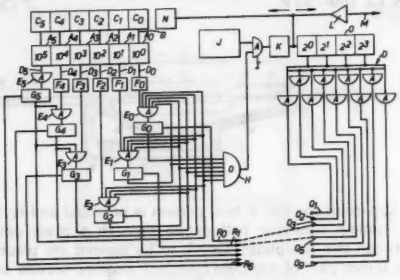
digital memory device is utilized to store information supplied by the code of one master while reproduction from a previous master is going on.

3,650,205

SERIAL NUMBER PRINTING MACHINES

Patrick S. Wybrow, Truro, and Philip Muzlish, North Harrow, both of England, assignors to said Wybrow, by said Muzlish

Filed Feb. 25, 1970, Ser. No. 13,936
Int. Cl. B41j *3/00;* **G06k** *19/00*
U.S. Cl. 101—72 **11 Claims**



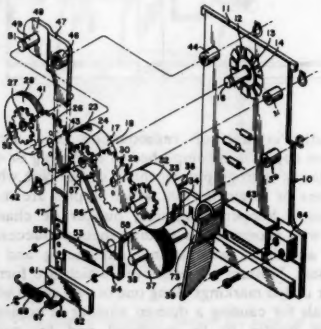
Machine having means for printing serial numbers and means for printing check digits. The check digit printer is controlled by means including counting means having one counting unit for each digit of the serial number to be printed, the advancement of a counting unit transmitting pulses to operate the check digit printer. The means for controlling the check digit printer may be electromechanical or electronic. The counting units may be cold-cathode gas filled decade counters.

3,650,206

PRINT STORAGE UNIT FOR DATA RECORDING SYSTEMS

William A. Seabury, III, Ulster Park, N.Y., assignor to Varifab, Inc., Old Greenwich, Conn.

Filed Feb. 25, 1970, Ser. No. 14,152
Int. Cl. B41j *1/40*
U.S. Cl. 101—93 C **13 Claims**



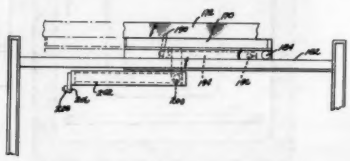
A print storage unit (PSU) for providing a visual read-out and a hard copy print-out of the contents of an electronic memory wherein a solenoid is energized by an operator striking a key on a keyboard. Energization of the solenoid activates an arm which simultaneously causes withdrawal of a detent from a display wheel and engagement of a pick-up wheel with a rotating power roll to enable a drive means to rotate the display wheel and a print wheel, which are in mesh engagement, until an electric signal from the keyboard is compared with a display wheel signal found on a commutator segment, after which the solenoid is deenergized to release the arm to simultaneously disengage the pick-up wheel from the power roll and engage the detent with the display wheel to lock the display wheel and print wheel into a stationary position, the display wheel exhibiting the selected character and the print wheel then being engaged by a platen to record the selected character on a suitable medium.

3,650,207

FLAT BED WEB PRESS INDEX AND REGISTRATION

James A. Black, 13700 Sparta, N.W., Kent City, Mich.

Original application Feb. 23, 1967, Ser. No. 617,885, now Patent No. 3,499,233, dated Mar. 10, 1970. Divided and this application Sept. 24, 1969, Ser. No. 870,720
Int. Cl. B41f *15/04, 15/10*
U.S. Cl. 101—115 **2 Claims**



Index and registration means for a continuous web printing apparatus having a web indexing apparatus to create index indicia at predetermined intervals along the web and web index register means at each printing station adapted to cooperate with the index indicia to cause momentary registry of the web with each printing unit for accurate printing. Specifically, the web indexing means punches holes in the web and the web index register means at each printing station includes a shiftable projection reciprocally movable toward the web holes to interengage the holes thereby holding the web in position at each printing station.

3,650,208

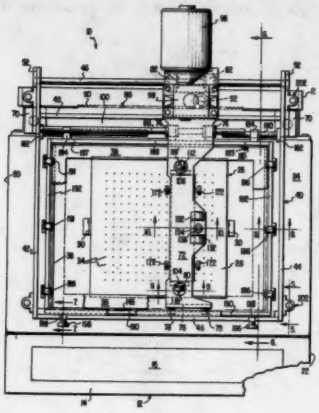
SCREEN PRINTING MACHINE WITH SINGLE-SIDED RACK-AND-PINION DRIVE

Daryl Gene Lambert, 1231 West Vista Avenue, Phoenix, Ariz.

Filed Nov. 17, 1969, Ser. No. 877,322
Int. Cl. B41f *15/08*
U.S. Cl. 101—123 **12 Claims**

A squeegee holding bar is pivotally coupled to a longitudinally moving squeegee drive bar which extends transversely across an overlying screen, the blank to be printed, and the table supporting the same, and has its pivot axis eccentrically adjustable by separate eccentrics at opposite ends of the squeegee assembly to facilitate complete parallelism between the platen (or blank thereon) and the movable squeegee during machine operation. The transversely extendable movable squeegee drive bar which holds the squeegee assembly is in turn supported at the front and rear by strong, vertically taut bars which are relatively fixed. A longitudinally extending rack is carried on the rear side of the rear squeegee drive support bar, a drive motor is fixed to the drive bar from which extends a spur drive gear in mesh with the rack. On the opposite side of the vertical squeegee support bar, there is a ball bushing assembly whose open face is directed towards the rack to take up the reaction force. The front support bar is F-shaped in configuration to receive within the groove facing the squeegee drive bar, a plurality of roller bearings carried by the squeegee drive bar. The frame as-

sembly which includes the squeegee drive bar may be raised and lowered relative to the table, and, when raised, allows



the screen and its support frame to pivot downwardly at one end to facilitate cleaning, removal, and replacement of the screen.

3,650,209

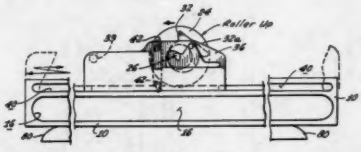
TRAVELING CYLINDER IMPRINTER WITH OVER CENTER PLATEN CYLINDER ACTIVATING MECHANISM

Davies Allport, La Jolla, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Nov. 17, 1969, Ser. No. 877,260

Int. Cl. B41f *3/04*

U.S. Cl. 101—269 **4 Claims**



The present invention relates to hand-operated imprinting machines, of the type used in gasoline stations, for example, for completing invoices from credit cards. The imprinter of the present invention is of the type in which a roller is drawn over an invoice, which is placed in the machine over the credit card, and which includes carbon paper, or other means, so that the embossments on the credit card may be printed on the invoice. The imprinter of the present invention includes a simple mechanism whereby the roller is lowered down into an operating position for one direction of movement of the carriage of the imprinter across the base, and which is lifted up out of the plane of the invoice and credit card for the other direction of motion of the carriage.

3,650,210

METHOD OF MAKING THEFT-PROOF CREDIT CARD

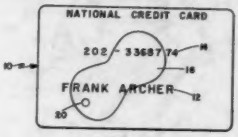
Frank Archer, 7826 Prospect Place, La Jolla, Calif.

Filed June 12, 1970, Ser. No. 45,710

Int. Cl. B41l *47/02*

U.S. Cl. 101—369 **2 Claims**

A credit card or similar identification card is constructed in the form now commonly accepted with the added step of making one segment easily separable from the card to be carried separately usually in the pocket or on a key chain and reinserted upon presentation. The segment carries a portion of the owner's name and a portion of the serial number of the card, and the segment is not completely separated from the



card as originally submitted to the owner. This feature facilitates production and handling of the card and the owner can use the card without detaching the segment if he is not concerned with achieving the extra protection resulting from carrying the parts separately.

3,650,211

A SHEET GRIPPING DEVICE FOR A ROTARY PRINTING PRESS

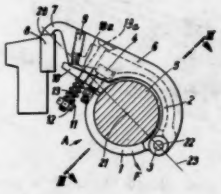
Wilhelm Nentwich, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher A. G., Offenbach am Main, Germany

Filed Feb. 16, 1970, Ser. No. 11,688

Claims priority, application Germany, Feb. 19, 1969, P 19 08 181.3

Int. Cl. B41f *21/04*

U.S. Cl. 101—409 **7 Claims**



A sheet gripping device for a rotary printing press includes a pivotal gripper finger which is moved into and out of gripping engagement with an abutment surface by reciprocating movements of a gripper shaft on which the gripper finger is supported. The surface area engageable by the gripper finger in its gripping position and the rotational axes of the shaft and the gripper finger are located on a substantially rectilinear line when the gripper finger is in engagement with the abutment surface.

3,650,212

ECONOMICAL, TOUGH, DEBRIS-FREE SHAPED CHARGE DEVICE AND PERFORATING GUN ASSEMBLY EMPLOYING SAME

Clarence Gerald Bauer, Albany, Tex., assignor to Western Dynamics, Inc., Forth Worth, Tex.

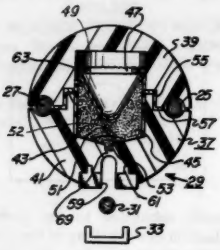
Filed May 11, 1970, Ser. No. 36,301

Int. Cl. F42b *3/08*

U.S. Cl. 102—20 **17 Claims**

A shaped charge device, and perforating gun assembly employing same, characterized by an economical case made of a thermosetting plastic containing a critical proportion of macerated material to induce a strength and toughness that enables resisting temperature, pressure, and impact deformation and breakage and invasion of fluids under conditions of use to depths in excess of 10,000 feet; yet that will disintegrate into small particles upon detonation, leaving no

harmful debris in a well being perforated. Through the use of the plastic containing the critical proportion of macerated material, thicker case walls may be employed yet still obtain



detonation therethrough. The critical thickness of walls adjoining a detonation means, and preferred construction features, plastics, and macerated materials are also disclosed.

3,650,213

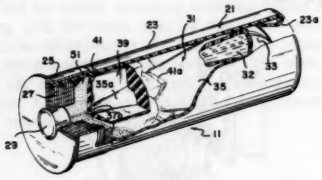
FRANGIBLE FILLED-PROJECTILE AMMUNITION

David D. Abbott, and Irwin R. Barr, both of Baltimore, Md., assignors to AAI Corporation, Cockeysville, Md.

Filed June 19, 1969, Ser. No. 835,313

Int. Cl. F42b *5/02*

U.S. Cl. 102—38 **20 Claims**



Ammunition is disclosed in which a generally teardrop shaped hollow projectile is formed of frangible plastic or other suitable material, the rear end of the projectile is finned and the forward rounded or ogive shaped end is scored or grooved for ease of rupture on impact, the projectile carries a payload of a desired flowable material such as a liquid, powder, or a gas, and preferably a liquid, for dispersion on impact at target, the projectile is carried in a cartridge case in which ignitable propellant powder is disposed adjacent the rear end of the projectile and adjacent a primer, there being a blanket of soft resilient flexible polyurethane foam surrounding and behind the rear finned area of the projectile and disposed between the fins and the propellant powder to retain the powder in place in a compact zone adjacent the finned rear of the projectile.

3,650,214

TOY ROCKET AND GAS PROPELLANT SYSTEM

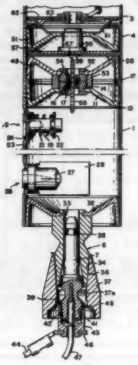
Charles J. Green, Vashon Island, Wash., assignor to Vashon Industries, Inc., Vashon Island, Wash.

Continuation-in-part of application Ser. No. 700,822, Jan. 26, 1968, now abandoned. This application Jan. 21, 1969, Ser. No. 814,484

Int. Cl. F42b *13/00*

U.S. Cl. 102—49.4 **11 Claims**

A model rocket propelled by a non-flammable liquefied gas is disclosed which is capable of realistic performance as well as appearance. The rocket has (1) a novel structural arrangement for separation of the nose portion of the rocket from the rocket body once the gas pressure in the pressure chamber has dropped and thrust is dissipated, (2) a novel valving arrangement for initiating the thrust which may be triggered remotely by means of an electrical current, and (3) a liquefied gas propellant which forms a gas-liquid mixture as



it flows through the rocket nozzle, the specific impulse of the gas-liquid mixture being considerably higher than the specific impulse obtainable from the pure liquid.

3,650,215

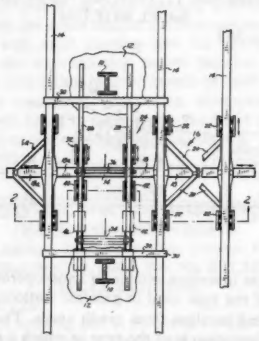
MOVABLE CROSSTRACK FOR BRIDGE CRANE

Nicholas H. Werthessen, Fort Lauderdale, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.

Filed May 18, 1970, Ser. No. 38,250

Int. Cl. E01b *25/22*

U.S. Cl. 104—98 **4 Claims**



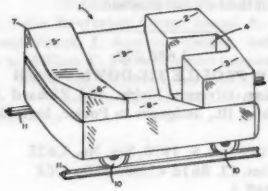
A bridge crane installation including at least one bridge crane and preferably two oppositely disposed and independently movable bridge cranes located between adjacent parallel rows of structural columns, and a movable crosstrack disposed on intermediate fixed runways located between the bridge cranes and between two columns in the same row of columns, adapted to be lined up with either or both bridge cranes to transfer a load from one bridge crane to another, or to pick up or deposit a load from or onto the floor space between the two columns not covered by the two bridge cranes. The crosstrack is supported by end trucks having wheels for riding on the intermediate runways and a brake is provided to stop the movable crosstrack at a desired location relative to the position of either or both of the bridge cranes with which the crosstrack is to be aligned. The movement of the crosstrack can be controlled from the floor, either manually by means of pull lines or by power means such as electric, pneumatic or hydraulic means.

3,650,216

RAILWAY CAR SPEED CONTROL TRANSPORTATION SYSTEM

Warren J. Harwick, and Joseph Wesley Broome, both of Milwaukee, Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Aug. 11, 1969, Ser. No. 849,083
Int. Cl. B61b *13/12*; B61c *11/00, 13/00*
U.S. Cl. 104—166 12 Claims



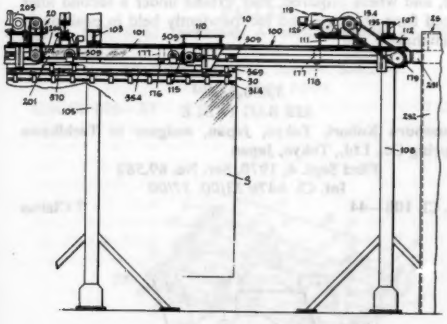
Individual cars of an operator-less railway transportation system are driven along a pathway by cooperation of a motor driven drive tube in each car that cooperates with angularly positioned reaction wheels spaced along the pathway. Controls are included for varying, in response to external signals, the angular position of selected reaction wheel assemblies to bring a car smoothly to a stop at a predetermined point, to bring a car past a particular point at a predetermined speed at a predetermined time, to insert a car from a side path into a gap in traffic on a main path, or to selectively delay cars to create gaps in the traffic to accept cars from a branch path.

3,650,217

SHEET HANDLING APPARATUS

Kenneth N. De Rose, Toledo, Ohio, assignor to Libbey-Owens-Ford Glass Company, Toledo, Ohio

Original application Aug. 30, 1967, Ser. No. 664,440, now Patent No. 3,495,724, which is a continuation-in-part of application Ser. No. 568,514, July 29, 1966, now abandoned. Divided and this application Jan. 19, 1970, Ser. No. 3,650
Int. Cl. B65g *17/46*
U.S. Cl. 104—172 S 4 Claims



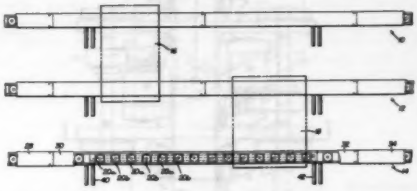
Conveyor means for moving sheet material along a conveyor system comprised of aligned units. The conveying means includes a carrier having connector means and each of the conveyor units is provided with endless driving belts. The connector members are arranged at the opposite ends of the carrier and are adapted to engage the endless driving belts by magnetic attraction.

3,650,218

AIR CONVEYOR

Wendell E. Losey, Lauderdale Lakes, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.

Filed Mar. 9, 1970, Ser. No. 17,692
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 6 Claims



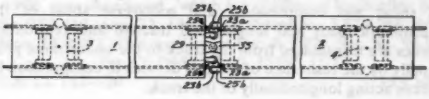
An air conveyor including air flotation cells spaced serially along a conveying path, a conveying pallet on the cells to be floated by air flowing from the cells, and means for supplying air to the cells to allow movement of the pallet along the conveying path. The pallet spans a plurality of cells, and preferably alternate cells communicate with different air supply ducts to provide alternate flotation systems. In a preferred embodiment, guides for guiding the movement of the pallet are included.

3,650,219

RESILIENTLY SUPPORTED ARTICULATED RAILWAY VEHICLE

Robert M. Seely, Florissant, Mo., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Nov. 24, 1969, Ser. No. 879,082
Int. Cl. B61f *3/12, 5/08, 5/18*
U.S. Cl. 105—4 R 17 Claims



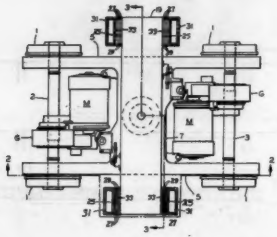
An articulated railway vehicle includes a truck having at least two wheeled axles, a truck frame supported on the axles, pairs of transversely spaced upright springs centered longitudinally of the truck and supported on the truck frame, a pair of body units aligned longitudinally of the truck and spaced apart longitudinally of the truck, elements projecting longitudinally from one of the body units and spaced apart transversely of the truck corresponding to the outer pair of springs and seated respectively thereon, and additional elements projecting longitudinally from the other body units and spaced apart transversely of the truck corresponding to the inner pair of springs and seated respectively thereon, the springs being distortable in shear generally longitudinally of the truck to accommodate relative swivel between the car bodies with each other and the truck, and transversely of the truck to cushion lateral forces. The bodies are connected to each other by a pivot structure above the center of the truck, which is connected to the truck frame to transmit longitudinal forces therebetween while accommodating relative swivel, transverse and vertical movements of the bodies with respect to the truck frame as are permitted by the springs.

3,650,220

RESILIENT RAILWAY VEHICLE SUSPENSION

Richard L. Lich, Town and Country, Mo., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Aug. 20, 1969, Ser. No. 851,672
Int. Cl. B61f 3/08, 5/14, 5/20
U.S. Cl. 105—199 F 7 Claims



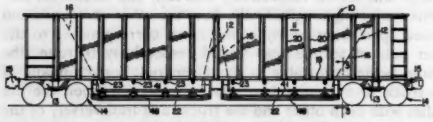
A railway vehicle suspension including a truck of the type having a transverse load supporting bolster swivelly supported on the truck framing and resiliently supporting the vehicle underframe for relative vertical and lateral cushioning movements only is constructed and arranged so that tractive forces are transmitted from the truck to the underframe at a desirable level below the bolster and at points laterally outboard of the truck frame without locating draft-transmitting devices in these regions where it would interfere with apparatus such as third rail current collection means. The vertical and lateral cushioning means and the draft-transmitting means comprise pairs of opposing transverse surfaces on the bolster and underframe at both sides of the truck inwardly and upwardly steeply inclined longitudinally of the truck, with similarly inclined flat elastomeric pad devices interposed between them, the normals of the surfaces and pads converging at a level below the bolster so that the lines of action of the resultants of the vertical and longitudinal forces, applied to the bolster through the pad devices, converge at a still lower level to provide the desirable low level effective traction transmission point. Vertical and lateral cushioning movements of the underframe on the truck are accommodated and yieldingly resisted respectively by the resilience in shear and compression, and transverse shear of the elastomeric pads and longitudinal tractive and retardation forces are transmitted from the truck to the underframe principally by the resistance of the pad devices to compression by forces acting longitudinally of the truck.

3,650,221

HOPPER CAR CLOSURE ACTUATING MECHANISM

Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Sept. 19, 1969, Ser. No. 859,325
Int. Cl. B61d 7/02, 7/18, 7/26
U.S. Cl. 105—240 7 Claims



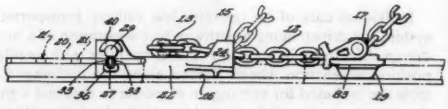
An open top hopper car is provided with a plurality of hoppers having lower discharge openings. Underneath each hopper, a pair of hinged doors are swingable downwardly and outwardly to a discharging position by motor actuated mechanism. The actuating mechanism includes vertically extending levers pivotally connected to the hopper and interconnected to so that hinging movement of one lever causes hinging movement of the other lever and the levers are moved out of supporting engagement with the doors whereby the doors are opened by gravity. The levers are also provided with camming means at their lower edges which engage cams provided on the doors for moving the doors to the closed position upon rotation of the levers. The camming arrangement provides for an effective closing of the doors and maintains the same in their closed position.

3,650,222

LOW PROFILE TIE-DOWN WINCH

Keith W. Broling, Olympia Fields, and Richard A. Tatina, Chicago, both of Ill., assignors to Portec, Inc., Oak Brook, Ill.

Filed Jan. 9, 1970, Ser. No. 1,625
Int. Cl. B61d 45/00; B60p 7/08
U.S. Cl. 105—369 A 14 Claims



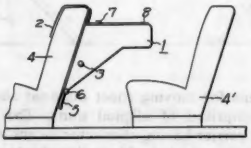
Low height tie-down ratchet winch for automobile rack cars arranged to increase the clearance between the winch and the vehicle tied down. The winch is adjustable along a channel having inwardly extending retainer flanges and facing locking notches carried in the flanges. The base for the winch has flanges extending in opposite directions from one end of the base beneath the retainer flanges of the channels and has a releasable locking lug at its opposite end, adapted to lockingly engage within a notch, to retain the base in position in the channel. A vertical axis winch block accessible from the top of the base is mounted in the winch block and is detachably retained thereto, as by a segment and notch connection between the base and a downwardly spaced flange portion of the winch block. A tie-down chain is secured to an arm extending from the winch block by a vertical pin, which may be removed without removing the base from its channel, or the winch block from the base. The chain extends under an idler in the form of an arched bar extending across the base, and where required, may extend under a second idler spaced from the base and independently held in position in the channel.

3,650,223

AIR BAG TABLE

Yasusaburo Kobori, Tokyo, Japan, assignor to Techikawa Spring Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1970, Ser. No. 69,582
Int. Cl. A47b 23/00, 37/00
U.S. Cl. 108—44 7 Claims



An air bag table for use in vehicles having an air bag which can not stand by itself but is capable of being inflated with

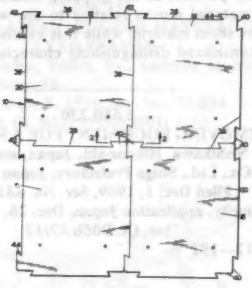
gas and forming a substantially flat plane at one portion thereof, a fixture for mounting the air bag on a desired portion in a vehicle compartment, a device for sealing gas in the air bag, and a pressure regulator, whereby when a vehicle passenger strikes against the inflated air bag, it automatically discharges the sealed gas from the air bag to safely protect the vehicle passenger.

3,650,224

WAREHOUSING PALLET

Robert F. Petix, Beaverton, Oreg.; Joseph A. Aquino, Mission Hills, and Frank J. Aquino, Agoura, both of Calif., assignors to William C. Holden, a part interest

Filed Aug. 25, 1969, Ser. No. 852,619
Int. Cl. B65d *19/00, 19/12*
U.S. Cl. 108—51 **3 Claims**



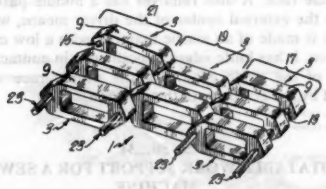
A warehousing pallet made up of two or more sections and having foot means projecting from each of the sections defining lateral openings for receiving the forks of a lift truck. Each of these sections has releasable attaching means arranged for releasably attaching one section to another. The releasable attaching means comprise dovetail joints formed in the side edges of the sections.

3,650,225

PALLETS

Brian Ball, 4982 Trenholme Avenue, Montreal 29, Quebec, Canada

Filed Dec. 15, 1969, Ser. No. 885,392
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **7 Claims**



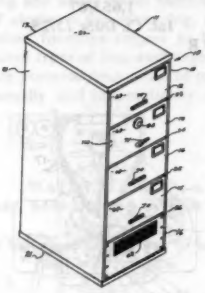
A pallet constructed from a plurality of block units nonrotatably connected together to form a rigid pallet platform surface.

3,650,226

DOCUMENT DESTRUCT FILE

John P. Conroy, Cincinnati; Kendall H. Grimes, Oxford, and Robert W. Maynard, Cincinnati, all of Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Nov. 12, 1970, Ser. No. 88,671
Int. Cl. E05g *1/00*
U.S. Cl. 109—25 **28 Claims**



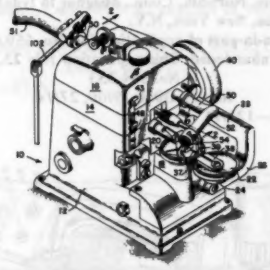
A security file so constructed as to facilitate expeditious destruction of documents and materials contained in the file. The file contains oxidizing panels which, upon ignition, burn and destroy the contents of the file. A flue extends along the back or the side walls and along the bottom of the cabinet. Containers of water are located in the bottom of the cabinet. The containers are made from a relatively low melting temperature material so that ignition of the oxidizing panels causes the containers to melt and the water contained in the containers to spill out and fill a portion of the flue chamber through which the gases of combustion must pass and be cooled before exiting from the cabinet.

3,650,227

FUR SEWING MACHINE

Fred L. Olday, 505 Bogart Place, Scranton, Pa.

Continuation-in-part of application Ser. No. 30,622, Mar. 31, 1970, now abandoned , which is a division of application Ser. No. 852,413, Aug. 22, 1969, now Patent No. 3,572,268, dated Mar. 23, 1971. This application Dec. 8, 1970, Ser. No. 96,095
Int. Cl. D05b *23/00, 35/00, 35/10*
U.S. Cl. 112—20 **15 Claims**



An improved apparatus for sewing strips of fur having a camming mechanism to maintain a guide shoe mechanism in a variably positioned medial plane between a feed wheel pair. The apparatus of this invention also lifts the guide mechanism to alternate positions within the vertical median plane to facilitate starting material into the nip of the feed

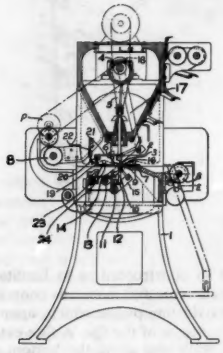
wheels and to allow the material to be guided by hand without interference by the guide mechanism, if so desired.

3,650,228

TUFTING MACHINES

Robert Douglas Lynch, Cleveleys, England, assignor to D. C. One Limited

Filed Jan. 8, 1968, Ser. No. 699,987
Claims priority, application Great Britain, Jan. 12, 1967, 1,653/67
Int. Cl. D05c *15/28*
U.S. Cl. 112—79 R **9 Claims**



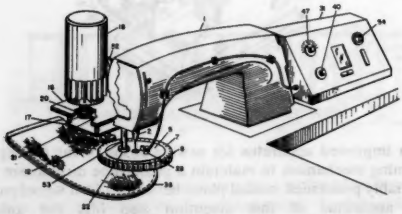
A tufting machine of the cut pile type in which a pair or more of eccentrically operated needle bars are spaced apart, two or more series of eccentrically operated looping hooks and knife cutters co-operate respectively with the sets of needles, the spacing of the needle bars and amplitude of sideways traverse of the fabric is a number of times greater than the pitch of the needles for forming symmetrical cross-over patterns of stitching, and the patterns are changeable by for example removing equally spaced needles and/or adjusting the feed of the fabric and/or adjusting the amplitude of sideways traverse of the fabric, by the use for example of differently shaped cams and differently sized pulleys, with common or separate operating mechanisms for the needles and associated parts.

3,650,229

FEED GUIDE FOR SHEET MATERIAL

Herman Rovin, Norwalk, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 659,096, Aug. 8, 1967, now abandoned. This application July 23, 1969, Ser. No. 854,333
Int. Cl. D05b *19/00, 27/14*
U.S. Cl. 112—121.11 **34 Claims**



Apparatus such as a sewing machine, having means, e.g., a feed dog cooperating with a presser foot, to pass sheet material over a work surface through a work point, is improved by adapting it to automatically steer or guide the sheet material through the machine. A rotatable gripping means such as a contact ring about the work point is arranged to intermittently engage the sheet material, synchronously with the action occurring at the work point. Associated therewith is means for actuating the gripping means into contact with the sheet material and for imparting a controlled rotational movement to the gripping means so that it moves arcuately with respect to the work point thus exerting a guiding action on the sheet material.

The gripping means can be located above or below the sheet material and can have opposed to it a cooperating surface to assist it in its clamping and guiding action. The rotational motion of the gripping means can be controlled by means of an optical edge sensor or it can be preprogrammed as by computer techniques.

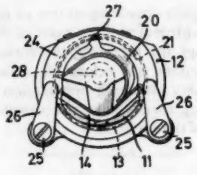
The fact that the rotatable gripping means contacts the sheet material at least over a series of points, preferably over an area at least in part surrounding the work point, and the fact that the position of the gripping means in contact with the sheet material moves relative to the work point in the plane of the sheet material while it is exerting its guiding action, are considered distinguishing characteristics of the invention.

3,650,230

DUST REMOVING EQUIPMENT FOR A SHUTTLE RACE

Masataka Nishikawa, Hikone-shi, Japan, assignor to Chiyoda Sangyo Co., Ltd., Shiga Prefecture, Japan

Filed Dec. 1, 1969, Ser. No. 881,004
Claims priority, application Japan, Dec. 26, 1968, 43/114028
Int. Cl. D05b *57/12*
U.S. Cl. 112—192 **3 Claims**



Dust removing equipment on the inside of the shuttle race of a lock stitch sewing machine. The shuttle race has a guide groove to receive the sliding part of the semirotary shuttle, and a driver is provided which reciprocates the shuttle along the shuttle race. A dust remover has a middle part which is fixed to the external center of the driver means, which dust remover is made of an elastic material with a low coefficient of friction. It has knife edges at both ends in contact with the bottom of the guide groove of the shuttle race which are retained by the elasticity of the material.

3,650,231

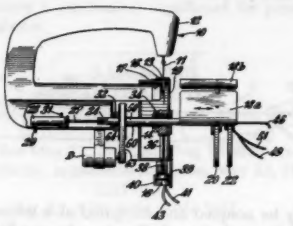
ROTATABLE WORK SUPPORT FOR A SEWING MACHINE

Louis E. Tinari, 40-25 Hampton Street, Elmhurst, N.Y., and David H. Kamena, 3 Peach Tree Court, Parsippany, N.J.

Filed Aug. 11, 1969, Ser. No. 848,966
Int. Cl. D05b *75/00*
U.S. Cl. 112—260 **9 Claims**

An improved sewing machine including a rotatable sewing table having a curved surface for supporting the material to

be sewn and for moving the material into the path of the sewing needle. A novel material supporting member is adapted

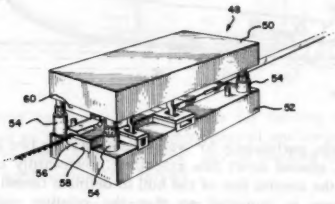


to be moved axially toward and retracted away from registry with the curved surface of the sewing table.

3,650,232
METHOD AND APPARATUS FOR MANUFACTURING LEAD FRAMES

Frederick Jay Heinlen, Etters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 8, 1970, Ser. No. 70,034
Int. Cl. B01j *17/00*; H01l *1/10*
U.S. Cl. 113—1 R **7 Claims**

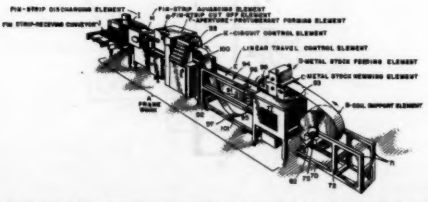


Lead frames having plate-like heat sink portion and three leads, one of which is integral with heat sink, are manufactured by blanking heat sink and leads, bending the integral lead relative to the heat sink, forming ends of the remaining leads, and again bending integral leads so that leads are in a plane which is parallel to, and spaced from, the heat sink.

3,650,233
APPARATUS FOR FORMING SHEET-METAL FIN-STRIPS FOR HEAT-EXCHANGERS

Fred M. Young; William V. Astrup, and Ronald E. Jones, all of Racine, Wis., assignors to Young Radiator Company, Racine, Wis.

Filed May 12, 1969, Ser. No. 823,925
Int. Cl. B21d *53/02*
U.S. Cl. 113—1 C **17 Claims**

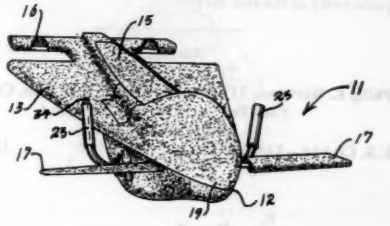


Apparatus for the automatic transformation of thin metal-stock into fin-strips of predetermined widths and lengths with groups of associated apertures and protuberances, for use in structuring core-units for heat exchangers required for controlling temperature conditions in various kinds of enclosures. The apparatus has juxtaposed elements, including one element for forming tube-embracing apertures and intermediate protuberances in the metal-stock and another element for recurring cut-off of predetermined lengths of finished fin-strips. All elements are arranged in series with antecedent elements for hemming the metal-stock, controlling the feeding and linear travel thereof, and with subsequent series of elements for advancing, discharging and stacking the finished fin-strips subject to later use in the structuring of desired types of heat-exchanger core-units. All of the elements are powered by a series of motors under the control of a manually and automatically operated switch mechanism.

3,650,234
WATER VEHICLE

Clarence H. Goudy, 8440 Pillsbury Avenue S., Minneapolis, Minn.

Filed Nov. 5, 1969, Ser. No. 874,331
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 A **3 Claims**

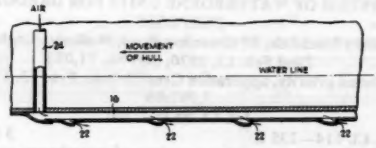


An underwater vehicle is disclosed which is intended for use by scuba divers and underwater swimmers. The vehicle has a streamlined, elongated body which the rider mounts in prone position. The vehicle is propeller driven by a battery powered electric motor, and is steered by a single control member which effects right, left, upward, downward and rolling vehicular movement.

3,650,235
HULL CONSTRUCTION

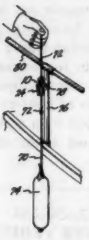
Norman Swanson, Conover, Wis., assignor to Veritas International

Filed July 31, 1969, Ser. No. 846,521
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A **2 Claims**



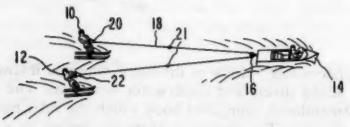
A hull construction for watercraft wherein means are provided for inducing the flow of a plurality of bubbles along the outer surface thereof to reduce frictional resistance to the passage of the watercraft through the water.

3,650,236
MARINE LINE HOLDER
Bob B. McFarlane, 5816 24th Avenue N.W., Seattle, Wash.
Filed Nov. 4, 1969, Ser. No. 873,838
Int. Cl. B63b *21/04*
U.S. Cl. 114—218 **9 Claims**



A unitary device for adjustably retaining or holding a knotted line to a marine craft or the like, having a shallowly tapered, generally cylindrical knot receiving and clamping channel which is provided with means for affixing the channel to the marine craft, having outwardly diverging ears to guide entry of the line therein.

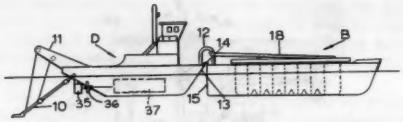
3,650,237
TOWING DEVICE
Philip L. Hartman, 3117 Maddux Drive, Palo Alto, Calif.
Filed Feb. 3, 1970, Ser. No. 8,264
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 WS **10 Claims**



A towing device for use behind a boat to tow a pair of water skiers. Pulley apparatus is provided through which a tow rope is provided. Locking means is provided for preventing rotation of the pulley and relative movement between the pulley and the tow rope during initial start up of the water skiers and at other times. Engaging means are provided for engaging the locking means with the pulley and rope when desired. The pulley apparatus is secured to the boat by a swivel which permits rotation of the pulley apparatus relative to the boat. Desirable, biasing means are included to maintain the locking means in a normally nonengaging position.

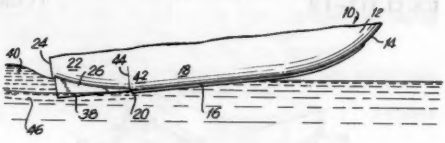
3,650,238
SYSTEM OF WATERBORNE UNITS FOR DREDGING PURPOSES
Geoffrey Stockdale, 57 Greenleas Road, Wallasey, England
Filed Feb. 13, 1970, Ser. No. 11,081
Claims priority, application Great Britain, Feb. 13, 1969, 7,797/69
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 R **3 Claims**

The invention provides a system of waterborne units for dredging purposes and comprises a dredger unit consisting of a relatively small self-powered vessel having normal ship form but with the forepart squared-off above the water-line, a stern propulsion and navigating unit the forepart whereof terminates at a flat bulkhead, and at least two hopper bow units the aft ends whereof terminate at flat sterns or bulkheads. The dredger unit and either of the two hopper bow units may be coupled and navigated for dredging operations, and the stern propulsion unit and either of the hopper bow



units may be coupled and navigated as a unitary vessel for the rapid disposal of spoil. Box type hopper barges may be provided for interposing between the above referred to navigable arrangements of units.

3,650,239
VEHICLE
Stewart P. Gast, 4600 Warrington Drive, New Orleans, La.
Filed Dec. 29, 1969, Ser. No. 888,386
Int. Cl. B63h *5/16*
U.S. Cl. 115—39 **9 Claims**



Vehicle, particularly for water travel, having two generally parallel spaced apart fins extending downwardly on either side of the central line of the hull to define a tunnel wherein the screw is mounted so that the relative water flow therethrough is substantially similar to water flow past a displacement-type hull and a pair of transverse steps extending oppositely transversely outwardly of the forward end of the fins so that relative water flow laterally of the tunnel will be substantially that produced by a planing type hull whereby water resistance is minimized while prop submersion is maximized.

3,650,240
CORRECT PRINTING INDICATOR
Richard Douglas Russell, deceased, late of 314 East Avenue, Newark, N.Y. (by Ada Gwennola Russell, administratrix)
Filed Oct. 17, 1969, Ser. No. 867,425
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **7 Claims**

The correct printing of both faces of a folded sheet is indicated by an opening formed in a printed region of an obverse panel visible when the sheet is folded, and a registering,

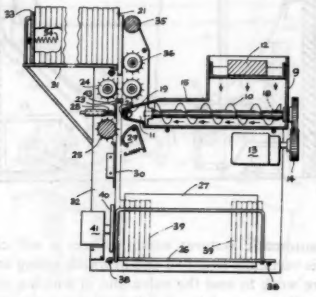
inked region of a reverse panel of the sheet visible through the opening when the sheet is folded. Incorrect printing or absence of printing on the reverse face of the sheet is indicated by blank paper visible through the opening. The inventive indicator is particularly significant for printed drug information sheets.

3,650,241

SPREAD APPLICATOR

Donald Edward North, 7 Rupert Terrace, Ascot, Queensland, Australia

Filed May 22, 1968, Ser. No. 731,131
Claims priority, application Australia, May 23, 1967, 22177/67
Int. Cl. A21c 9/04; B05c 5/02
U.S. Cl. 118—2 **4 Claims**



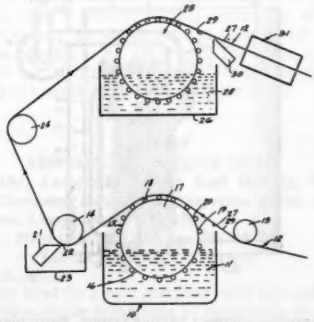
A spread applicator having means for feeding slices a bread past an applicator containing spread and arranged to dispense the spread onto the bread and for stacking the latter after the application of the spread.

3,650,242

COATER WITH APPLICATOR RODS

Ralph P. Mahoney, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation of application Ser. No. 775,466, Nov. 13, 1968, now abandoned. This application Oct. 14, 1970, Ser. No. 80,808
Int. Cl. B05c 1/12
U.S. Cl. 118—246 **5 Claims**



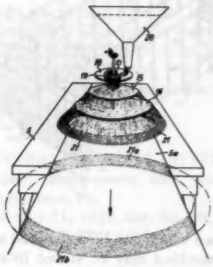
A device for applying coating material to the surface of a moving web of material such as paper or the like wherein a drum is rotatably mounted to have a portion thereof pass beneath the surface of a coating fluid bath and to have a portion thereof extend above the fluid bath. The coating drum has a series of rod-like members disposed longitudinally along the outer surface thereof. The rod-like members have a diameter which is substantially less than the diameter of the cylindrical drum and are arranged to pass beneath the coating fluid bath and to carry fluid above the surface of the bath into contact with the moving web. The web of material rides against the outer surface of the rod-like members and is coated uniformly as the cylindrical drum is rotated.

3,650,243

DEVICE FOR THE UNIFORM APPLICATION OF SMALL AMOUNTS OF A POWDERY MATERIAL ONTO SURFACE CONFIGURATIONS

Hans Brehm, Fuerth/Odenwald, Germany, assignor to Carl Freudenberg, Weinheim/Bergstrasse, Germany

Filed Aug. 8, 1969, Ser. No. 848,505
Claims priority, application Germany, Apr. 9, 1969, P 19 18 033.7
Int. Cl. B05b 7/14
U.S. Cl. 118—308 **4 Claims**



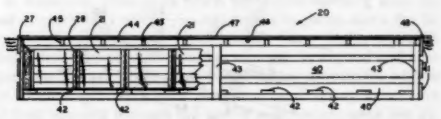
Apparatus for depositing particulate material onto a textile fabric, particularly thermoplastic adhesive particles onto a non-woven substantially continuous fabric, including means for depositing the particulate material onto a feeder disc with an inwardly directed spiral bead thereon and an aperture in the center thereof, a centrifugal spreader disc disposed beneath the feeder disc, means for, rotating the discs, and means for passing the fabric beneath the spreader disc whereby only part of the annular centrifuged particles are deposited on the textile fabric. 15

3,650,244

METHOD AND APPARATUS FOR PROTECTING AND ENHANCING THE GROWTH OF YOUNG SHELLFISH SETS

Edwin C. Fordham, 336 Park Street, Stratford, Conn.

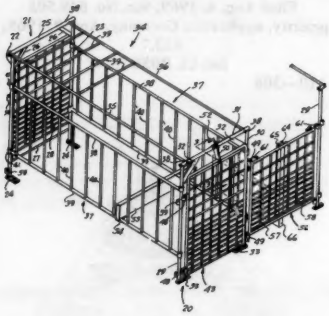
Filed Dec. 18, 1969, Ser. No. 886,125
Int. Cl. A01k 61/00
U.S. Cl. 119—4 **14 Claims**



This disclosure is directed to a method and apparatus for protecting and enhancing the growth of young oysters or shellfish sets in their natural environment. This is attained by placing "clutchless sets" into trays constructed to entrap the "clutchless sets" therein while permitting the free flow of sea

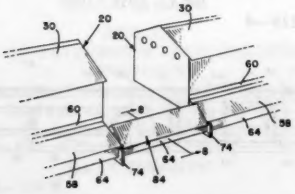
water therethrough to supply the contained "clutchless sets" with natural food, and by floating the trays in groups adjacent the warmer upper strata of the sea water. The arrangement protects the "clutchless sets" from their natural enemies, and renders them readily movable from place to place as may be required until such time that they may be safely placed into their permanent bed to grow naturally to maturity.

3,650,245
FARROWING PEN
Wayne D. Karnes, Studley, Kans.
Filed Jan. 2, 1970, Ser. No. 133
Int. Cl. A01k *01/02*
U.S. Cl. 119—20 **10 Claims**



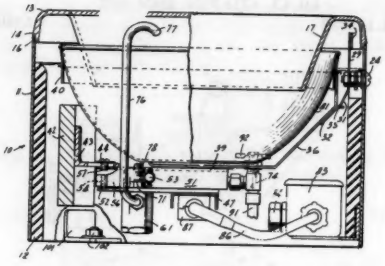
A farrowing pen which can be assembled and disassembled and when disassembled may be stored in a relatively small area. The sow is confined to a relatively small space while the baby pigs are permitted to move about outside of the space in which the sow is confined so that they may avoid being crushed to death by the sow. THe sides of the pen are adjustable in height and the pen is provided with an entry gate reversibly hinged in its opening and a pivoted tailboard to facilitate the movement of the sow into and out of the confined area. The floor area is unobstructed for ease of cleaning the pen.

3,650,246
AUTOMATIC EGG COLLECTION SYSTEM FOR POULTRY NESTS
Grady C. Fowler, Route 7, P.O. Box 235, and Ben F. Venable, Route 8, P.O. Box 640, both of Mt. Airy, N.C.
Filed Mar. 18, 1970, Ser. No. 20,498
Int. Cl. A01k *31/16*
U.S. Cl. 119—48 **12 Claims**



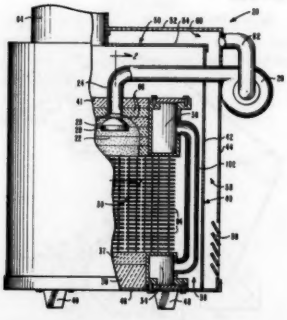
A system for gathering eggs from a plurality of nesting units and conveying the eggs to a collection area for grading. A conveyor having a resilient surface with egg-receiving indentations spaced therealong is completely covered within the nesting area to prevent egg damage. The eggs are dispensed automatically from the nests onto the conveyor and from the conveyor to a grading table.

3,650,247
AUTOMATIC WATERER
James E. McKinstry, Cedar Rapids, Iowa, assignor to Nelson Manufacturing Company, Cedar Rapids, Iowa
Filed May 14, 1970, Ser. No. 37,137
Int. Cl. A01k *07/00*
U.S. Cl. 119—81 **6 Claims**



An automatic waterer which utilizes a self closing valve which is vertically installed and in which spring and hydraulic pressure work to seat the valve and in which a pivoted beam which utilizes a weight of substantial mass at one end and which carries a drinking bowl on the other end is provided. As animals drink from the bowl the mass overcomes the weight of the liquid in the bowl and lowers the beam on the valve actuator so as to replenish the liquid supply in the bowl thus rebalancing the beam and allowing the valve actuator to return to the closed position.

3,650,248
HEATING SYSTEM
Avy Lewis Miller, 4090 Valley Meadow Road, Encino, Calif.
Filed June 8, 1970, Ser. No. 44,335
Int. Cl. F22b *21/04*
U.S. Cl. 122—235 R **7 Claims**



An improved compact heating system, particularly adapted for heating water and for steam generation, includes a combustible gas supply zone, a combustion chamber therearound in the form of a burner element comprising a refractory cup in heat exchange relation with an array of heat exchange elements spaced peripheral therefrom, and gas ignition means.

The system is adapted to efficiently burn a high velocity stream of combustible gases and develop a wide range of B.t.u. outputs per hour, including multi-million B.t.u. outputs, while providing advantages of larger types of heating systems, including easy access for maintenance, repair, replacement and clean-up.

3,650,249

APPARATUS FOR UTILIZING COOLING AIR FOR AN INTERNAL COMBUSTION ENGINE FOR HEATING A PASSENGER COMPARTMENT

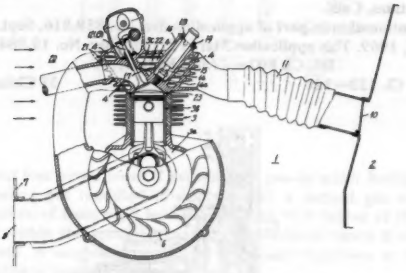
Soichiro Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 12, 1970, Ser. No. 45,775

Claims priority, application Japan, Sept. 4, 1969, 44/69727

Int. Cl. F01f *1/32*; F01p *1/10*; B60h *1/02*

U.S. Cl. 123—41.32 **10 Claims**



An internal combustion engine for a motorcar has, at the outer surface of at least its cylinder head portion, a forced cooling air passage which is in communication at its outlet with the interior of the passenger compartment. The spark plugs are positioned within this passage and a tubular partition wall surrounds each plug to isolate the plug in airtight manner from the interior of the passage. Each partition wall has an opening at its upper end in communication with the external air. The tubular wall may be provided at its base portion with an opening extending into the interior of the passage, so that a portion of the cooling air within the passage flows into the interior of the tubular wall and out through the opening at the upper end. The upper end of the tubular wall may be provided with a cover and the opening at the upper end extends laterally beneath the cover.

3,650,250

AIRCOOLED CYLINDER HEAD

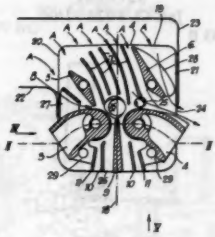
Ludwig Lohr, Lampertheim, and Karl Hellwig, Weiheim, both of Germany, assignors to Farymann Diesel, Farny & Weidmann, Lampertheim, Germany

Filed Dec. 16, 1970, Ser. No. 98,764

Int. Cl. F02f *1/32*, *1/34*, *1/42*

U.S. Cl. 123—41.69 **7 Claims**

A cylinder head for a twin overhead valve air-cooled internal combustion engine comprising an upper plate and a lower plate so interconnected by valve ports, ribs and walls to define passages through which cooling air can flow. The ribs and walls extend from air inlet places to the vicinity of an injection nozzle and said valve ports substantially parallel to the cylinder axis and obliquely to a plane of symmetry of the cylinder head passing parallel to said cylinder axis through a central cooling air duct in the cylinder head. The valve ports extend transversely to the said plane of symmetry substantially over the entire width of the cylinder head. Cooling air guide walls surround the cylinder head on sides thereof adjacent said air inlet places and extend at least approximately as far as said valve ports. These guide walls are arranged so that cooling air flows partly over the sides of the valve ports which are nearest to said ribs and walls but otherwise is forced to flow through said central cooling air duct.



3,650,251

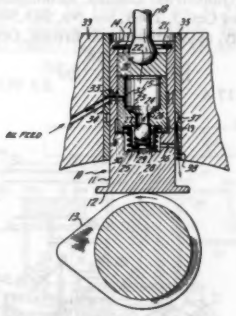
HYDRAULIC VALVE LIFTER

Winton J. Pelizzoni, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed May 11, 1970, Ser. No. 36,335

Int. Cl. F01l *1/24*, *1/14*

U.S. Cl. 123—90.57 **9 Claims**



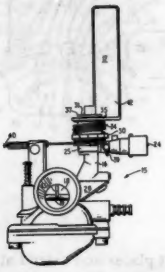
A hydraulic lifter with bleed provisions opening near the end of every lift (valve opening) stroke to pump down the lifter's high pressure oil chamber. A lifter body, centrally bored, houses a plunger which is movable to expand and contract the high pressure chamber. Plunger movement adjusts the lifter length. The lifter rides in a close fitting sleeve. An oil feed opening through the sleeve supplies oil, once per cycle, to a reservoir through aligned openings in the lifter body and plunger. Near the end of each lift stroke, when the compression on the lifter is great, a bleed hole through the lifter body aligns with a bleed passage in the sleeve. Oil is repeatedly forced from the high pressure chamber, assuring the removal of all air accumulated in the chamber and stopping initial valve lash and clatter.

3,650,252

ENGINE GOVERNORS

Peter David Glover; Richard Forshaw, and William Henry Steele, all of Milpera, New South Wales, Australia, assignors to Victa Limited, New South Wales, Australia

Filed Mar. 31, 1970, Ser. No. 24,129
Claims priority, application Australia, Mar. 31, 1969, 52793/69
Int. Cl. F02d *31/00*
U.S. Cl. 123—103 B 7 Claims



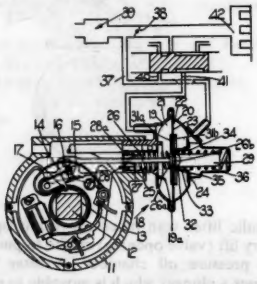
Means for governing the speed of an engine by providing attached to the carburetor butterfly spindle an air vane deflected by a stream of engine-cooling air produced by the engine to close the butterfly against spring action, and accelerator control means for the engine operating to increase tension on the spring with its advancement and to decrease the tension with retarding of the accelerator.

3,650,253

VACUUM OPERABLE UNITS FOR USE WITH IGNITION DISTRIBUTORS

William Harold Cooksey, Walsall, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 3, 1969, Ser. No. 863,504
Claims priority, application Great Britain, Oct. 14, 1968, 48,524/68
Int. Cl. F02p *5/04*
U.S. Cl. 123—117 A 2 Claims



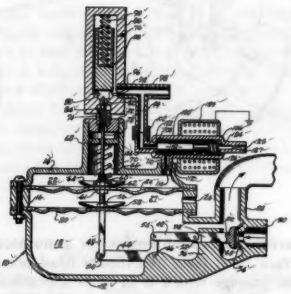
A vacuum-operable unit for use with an ignition distributor in which a casing is divided into first and second chambers by a resilient diaphragm. A plunger is slidably received in the first chamber, with the plunger being secured at one end to the diaphragm and extending at its other end from the first chamber for connection to a distributor. Axial movement of the plunger varies the ignition timing of the distributor. First and second conduits are provided in communication with the first and second chambers respectively, and resilient means within one of the chambers resists movement of the diaphragm in a direction to reduce the volume of that chamber. Sealing means acts between the wall of the first chamber and the plunger to fill the first chamber while allowing relative movement between the plunger and the wall of the first chamber, with the sealing means being constituted by a pair of annular members secured to the plunger and the wall of the chamber respectively, and interconnected by a flexible tubular member. The diameter of the flexible tubular member of the sealing means tapers from a maximum diameter adjacent one annular member to a minimum diameter adjacent of the other annular members and the tubular member is turned inside out intermediate its ends so that part of the tubular member surrounds a further part of the member, and the tubular member together with said annular members constitutes a rolling seal.

3,650,254

METHOD AND APPARATUS FOR RAPIDLY CHANGING THE AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE FROM A LEAN CONDITION TO A RICH CONDITION

Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.

Continuation-in-part of application Ser. No. 858,816, Sept. 17, 1969. This application Mar. 16, 1970, Ser. No. 19,884
Int. Cl. F02m *21/02;* F02n *17/00*
U.S. Cl. 123—120 31 Claims



A regulator in the fuel system of a vehicle's internal combustion engine regulates the fuel pressure of a gaseous fuel, such as natural gas, to a fuel-air mixer. The regulator maintains a predetermined fuel pressure for idle and cruise conditions and increases fuel pressure to effect an enriching of the air-fuel ratio for full throttle conditions. The degree of enriching is sufficient to pass through a region where there is a threat of exhaust valve burning and where the maximum amount of the oxides of nitrogen are produced. The change in air-fuel ratio is extremely rapid to avoid operation for any material amount of time in this region. The regulator also effects a change from a rich air-fuel ratio to a lean one at a predetermined point in throttle setting below the point at which enriching occurs.

3,650,255

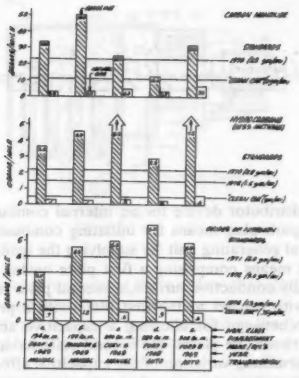
METHOD AND SYSTEM FOR REDUCING OXIDES OF NITROGEN AND OTHER POLLUTANTS FROM INTERNAL COMBUSTION ENGINES

Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.

Filed Sept. 17, 1969, Ser. No. 858,816
Int. Cl. F02m *21/02, 13/08*
U.S. Cl. 123—120 12 Claims

Oxides of nitrogen (NO_x) in the exhaust gas emissions of an internal combustion engine are reduced, as measured on a

standard 7-mode driving cycle, by utilizing natural gas as a fuel and operating with an equivalence ratio from about 1.25 to about 1.35. The 1.25 value corresponds to the maximum permissible amounts of NO_x as measured in parts per million. The 1.35 value corresponds to the value where unacceptable



power loss would result if exceeded. A gas-air mixer having a metering pin modified to operate with a natural gas inlet pressure of from −0.5 inches of H_2O to +0.5 inches of H_2O and within the specified range of equivalence ratios is employed. A modulator produces a fuel-rich condition at full throttle to increase power.

3,650,256

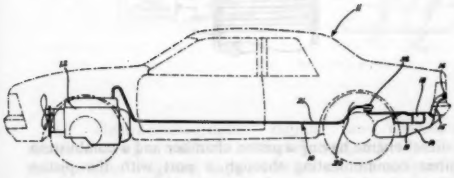
FUEL EVAPORATIVE CONTROL SYSTEM

Charles J. Marshall, Detroit, Mich., assignor to American Motors Corporation, Kenosha, Wis.

Filed Aug. 14, 1970, Ser. No. 63,699

Int. Cl. F02m *25/08*

U.S. Cl. 123—136 **7 Claims**



A system designed to prevent raw fuel vapors from entering the atmosphere from the carburetor fuel bowl and the fuel tank of a motor vehicle. The carburetor is internally vented and the fuel tank vent line routes the vapors from the tank through a float type liquid-vapor separating valve to the cylinder head cover of the engine. The vapors are stored in the crankcase of the engine while the engine is not operating and combusted during engine operation with the blow-by products by use of the positive crankcase ventilation system.

3,650,257

FUEL CONTROL APPARATUS

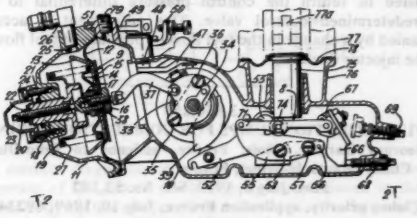
John Peter Soltau, 5 Lightwood Close, Copt Heath, and Robert Edward Kelly, 45 Featherstone Crescent, Shirley, both of Solihull, Warwickshire, England

Filed Apr. 2, 1970, Ser. No. 25,228

Claims priority, application Great Britain, Apr. 14, 1969, 18,905/69

Int. Cl. F02d *1/00*

U.S. Cl. 123—139 BG **13 Claims**



An apparatus for controlling the fuel supply to an engine by adjustment of the control stop of a fuel injection metering pump has a three-dimensional cam whose angular and axial positions are variable in response to engine operating conditions, for example intake manifold pressure and throttle lever position. A cam follower for the three-dimensional cam in turn rotates a two-dimensional cam. A further cam follower, for the two-dimensional cam, can be moved along the two-dimensional cam in response to a third engine operating condition, for example the position of the engine choke control. The resultant position of the further cam follower is transmitted to the control stop of the metering pump.

3,650,258

FUEL INJECTION SYSTEMS

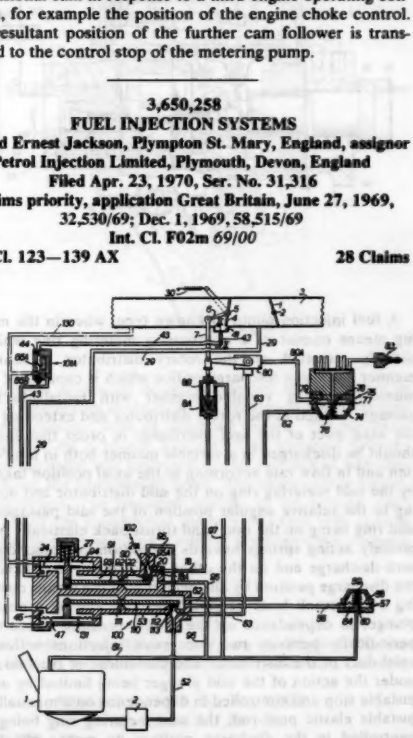
Harold Ernest Jackson, Plympton St. Mary, England, assignor to Petrol Injection Limited, Plymouth, Devon, England

Filed Apr. 23, 1970, Ser. No. 31,316

Claims priority, application Great Britain, June 27, 1969, 32,530/69; Dec. 1, 1969, 58,515/69

Int. Cl. F02m *69/00*

U.S. Cl. 123—139 AX **28 Claims**



A fuel injection system for an internal combustion engine, including a fuel motoring device and/or a fuel pressurizing

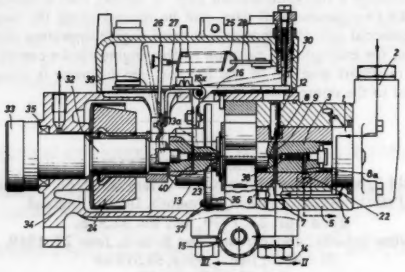
device. The or each device operates in response to adjustment of an air valve located in the engine air intake conduit (for example, upstream of the throttle valve), such adjustment being effected by a control mechanism in the following manner. The air valve produces a control pressure differential in the air intake conduit, which is sensed by the control mechanism. Any change in the pressure differential from a predetermined control value (caused, for example, by an increase in the engine air intake) causes the control mechanism to adjust the fuel flow path which feeds the fuel injector devices. The air valve is connected to the fuel control circuit and the position of the air valve is thereby adjusted to return the control pressure differential to the predetermined control valve. This adjustment is accompanied by a change in the fuel flow or pressure of fuel flow to the injector devices.

3,650,259

FUEL INJECTION PUMPS FOR COMBUSTION ENGINES

Georges Garnier, Blois, France, assignor to Roto-Diesel, Clichy (Hauts-de-Seine), France

Filed July 6, 1970, Ser. No. 52,182
Claims priority, application France, July 10, 1969, 6923487
Int. Cl. F02d *31/00*
U.S. Cl. 123—140 **6 Claims**



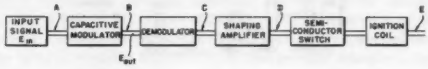
A fuel injection pump of known type, wherein the metering means consist of a nonrotating metering ring which is slidably mounted on the rotary distributor in leaktight manner and has a discharge orifice which is capable of communicating in a variable manner with radial discharge passages formed in the rotary distributor and extending from the axial duct of the said distributor in order that the fuel should be discharged in a variable manner both in time duration and in flow rate according to the axial position taken up by the said metering ring on the said distributor and according to the relative angular position of the said passages, the said ring being on the one hand thrust back elastically by oppositely acting springs towards a position corresponding to zero discharge and on the other hand thrust back axially in the discharge position by all-speed regulating means comprising a bell-crank lever actuated hydraulically by a push-rod plunger in dependence on the supply pressure which exists periodically between two successive injections within the axial duct of the distributor, the movement of the said lever under the action of the said plunger being limited by an adjustable stop and controlled in dependence on a manually adjustable elastic push-rod, the said metering ring being also controlled in the discharge position by means which are responsive to the speed of rotation of the engine and to the controlling action of the accelerator.

3,650,260

BREAKERLESS IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Raffaele Vittorio Silvera, 2046 Ocean Parkway, Brooklyn, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,084
Int. Cl. F02p *1/00*
U.S. Cl. 123—148 E **17 Claims**



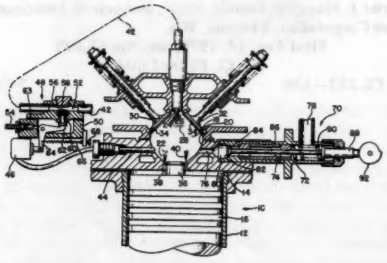
In a distributor device for an internal combustion engine having spark plug means for initiating combustion, an ignition signal generating unit for supplying the ignition pulses to the plug means comprising a first plate having at least one electrically conductive surface, a second plate rotatably supported with respect to the first plate with a predetermined gap therebetween for allowing a capacitive action to take place between the plates, the second plate having a configuration permitting variation of the capacitive effect between a maximum and a minimum value, whereby an input voltage to the unit is amplitude modulated as an output voltage.

3,650,261

DIESEL ENGINE

Thomas A. Hutsell, 1220 Carpenter, Mount Vernon, Wash.

Filed Nov. 18, 1970, Ser. No. 90,743
Int. Cl. F02b *77/00, 3/00*
U.S. Cl. 123—198 DB **11 Claims**

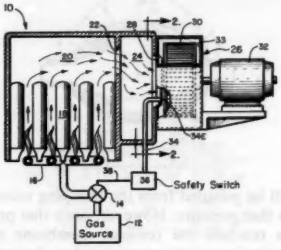


A diesel engine having a piston chamber and a combustion chamber communicating through a port with the piston chamber; a temperature sensing means which is responsive to temperature in the combustion chamber and which controls a valve to permit fuel flow to the combustion chamber only when the temperature in the combustion chamber has reached a predetermined level to support combustion; a supercharger responsive to engine speed and arranged to deliver pressurized air to the combustion chamber when the engine is operating; and a protrusion mounted on the piston and arranged to extend into the port so as to form an annular passageway through which air blows from the piston chamber into the combustion chamber to cause better mixing of fuel and air in the combustion chamber.

3,650,262
FORCED DRAFT FURNACE SAFETY SYSTEM

Warren W. Root, and William W. Frank, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 25, 1970, Ser. No. 49,886
Int. Cl. F23n *1/06*; F24h *3/02*
U.S. Cl. 126—110 R 5 Claims

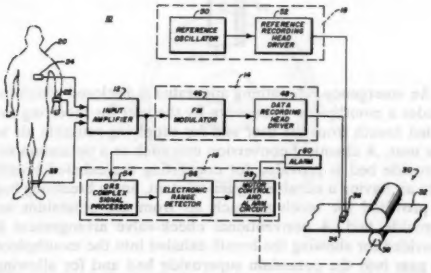


A safety system for sensing the air flow through a forced draft furnace and using that sensed flow to operate a switch which prevents gas fuel from being supplied to the furnace in the absence of such flow is disclosed in which a vacuum sensing tube is positioned at the edge of the inlet to a centrifugal blower within a specific range of angular positions to obtain a sufficiently large magnitude of pressure differential to operate the switch.

3,650,263
MONITORING SYSTEM

William W. Kowalski, and James R. Ricketts, both of Milwaukee, Wis., assignors to Marquette Electronics, Inc., Milwaukee, Wis.

Filed Nov. 3, 1969, Ser. No. 873,293
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 G 25 Claims

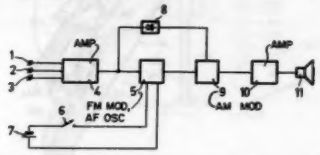


The electrocardiographic signals are continuously recorded along a track on an endless magnetic tape within the portable magnetic tape recorder as the subject goes about his normal activities so that the most recently occurring electrocardiographic signals are always on the tape unless the frequency of the QRS complex signals departs from a range previously set into an electronic range detector, in which case the motor is stopped after a predetermined time delay that causes the tap to contain the signals occurring prior to the time of the departure from the range on half of the tape and the signals occurring after the departure from the range on the other half of the tape. An audible alarm is sounded when the motor stops so that the subject may change magnetic tapes and may make a note of his activities at the time the ORS complex signals departed from the range set on the detector.

3,650,264
APPARATUS FOR ELECTRO-MEDICAL INVESTIGATION

Frits Jacques Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,462
Claims priority, application Netherlands, Dec. 4, 1968, 6817326
Int. Cl. A61l *5/04*
U.S. Cl. 128—2.06 A 4 Claims

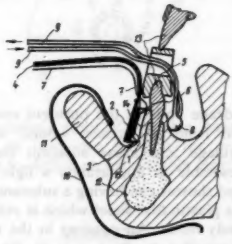


A medical diagnostic apparatus for producing an audible indication of the nature of electric signals produced in the human body by the action of the heart. An audio frequency carrier wave is modulated both in frequency and in amplitude in accordance with the aforesaid applied electric signals. The level of the fundamental tone normally remains below the limit of audibility. This limit is exceeded only when an electric heartbeat signal occurs.

3,650,265
PICK-UP DEVICE DETECTING CHANGES OF THE VOLUME OF MUCOUS MEMBRANES IN THE MOUTH

Stephan Figar, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

Filed Nov. 10, 1969, Ser. No. 875,277
Int. Cl. A61b *5/05*
U.S. Cl. 128—2.1 E 7 Claims



A pick-up device for detecting changes in the volume of mucous membranes in the mouth consisting of a plate shaped electrode provided with an insulating coating. The electrode is supported by a holder adapted to be clamped between teeth of the upper and lower jaw so that one side of said electrode faces the investigated tissue. The other side is electrically screened. The insulated coating of the pick-up electrode facing the investigated tissue is provided with at least two extension for securing a correct predetermined distance from said tissue.

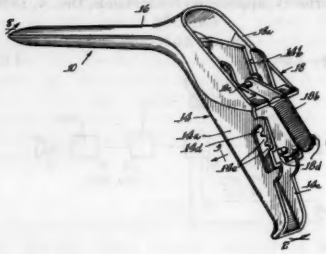
3,650,266
SPECULUM

John A. Pestka, Park Ridge, and James A. Huggins, Racine, both of Wis., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 2, 1970, Ser. No. 7,921
Int. Cl. A61b *1/00*
U.S. Cl. 128—17 6 Claims

The present invention relates generally to improvements in inspection instruments or speculums used for dilating passages in the human body. And more particularly, to in-

struments of the above-mentioned type which may be plastic molded and hence produced at an extremely low cost. An embodiment of the invention disclosed herein comprises a pair of upper and lower pivotally coupled elongate jaw members and a handle section integral with each jaw member and



extending generally laterally therefrom. A series of notches in one of the handle sections is adapted to interlock with lug means on the other handle section, said lug means being maintained in interlocking position as an incident to external pressures tending to close the jaw members.

3,650,267

SURGICAL DRAPE

Dale L. Anderson, Roseville, Minn., assignor to Johnson & Johnson

Filed Feb. 12, 1970, Ser. No. 10,944

Int. Cl. A61f *13/00*; **A61b** *19/00*

U.S. Cl. 128—132 **9 Claims**

A surgical drape collects the purulent material and body fluids released from an incised wound while effectively preventing spillage into areas adjacent the incision. The drape may resemble in appearance a light weight flexible type of inverted shower cap having a substantially flat bottom and made of a plastic film sheet which is resistant to the absorption of body fluids. An opening in the drape has a size adequate to permit a working area in the interior of the drape for the fingers of the surgeon. A pressure sensitive adhesive coating is applied exteriorly to the wall (bottom) of the drape opposite the opening in order to enable the drape to be releasably affixed to the skin of the patient over the area where an incision is to be made. A protective liner or peel patch covers the adhesive coating until such time as it is desired to attach the drape to the patient.

3,650,268

APPARATUS FOR ARTIFICIAL RESPIRATION OR NARCOSIS

Henning M. Ruben, Copenhagen, Denmark, assignor to Ruth Lea Hesse, Copenhagen, Denmark

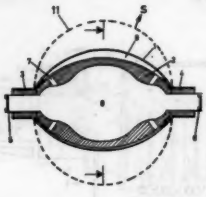
Filed July 7, 1969, Ser. No. 839,592

Claims priority, application Sweden, July 8, 1968, 9387/68

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.7 **8 Claims**

An insufflation apparatus for performing artificial respiration or narcosis of the type including a pumping means for moving gas from a gas source to a patient, inlet means for connecting the pumping means to the gas source, outlet means for connecting the pumping means to the air ducts of the patient, and check valve means in each of the inlet means and outlet means for preventing back flow of gas is improved by forming one wall of the pumping means with a resilient membrane. The resilient membrane serves as an elastic means for resisting increases in gas pressures up to a predetermined pressure which will not harm the patient so



that gas will be pumped from the pumping means to the patient below that pressure. However, once that predetermined pressure is reached the resilient membrane expands and serves as elastic means compensating forces tending to further increase the gas pressure thereby limiting the overpressure in this system to said predetermined pressure.

3,650,269

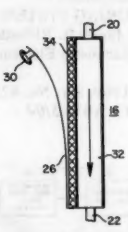
EMERGENCY OXYGEN REBREATHER SYSTEM

Daniel L. Curtis, Manhattan Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 25, 1970, Ser. No. 75,428

Int. Cl. A61m *15/00*; **B01d** *53/00*; **F28c** *1/00*

U.S. Cl. 128—212 **10 Claims**



An emergency rebreathing apparatus is disclosed which includes a mouthpiece to be worn by the user for receiving exhaled breath from the user and for supplying reusable air to the user. A chemical conversion unit such as a potassium superoxide bed is provided for converting the exhaled breath into air having a suitable oxygen content, and a breathing bag is provided for receiving such air from the potassium superoxide bed. A conventional check-valve arrangement is provided for allowing the breath exhaled into the mouthpiece to pass into the potassium superoxide bed and for allowing inhaled breath to be drawn from the breathing bag to the mouthpiece. A hermetically sealed evaporative cooler is provided which is in thermal contact with the bed for maintaining its temperature below a predetermined maximum temperature, and control means are provided for actuating the cooling means only when it is desired to use the rebreathing apparatus.

3,650,270

NIPPLE-RETAINING RING ASSEMBLY

Thomas A. Frazier, Williamsport, Pa., assignor to The West Company, Phoenixville, Pa.

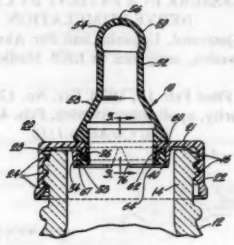
Filed Feb. 18, 1970, Ser. No. 12,292

Int. Cl. A61j *11/00*

U.S. Cl. 128—252 **8 Claims**

In combination, a retaining ring and nipple ring assembly for application to a container, said retaining ring including a

top, a skirt depending from the outer edge of the top having means for securing the retaining ring to the container, an inner wall depending from the inner edge of the top defining an opening through which the nipple engages, an outer wall depending from the top and spaced radially from the inner wall to define a circumferentially extending channel therebetween, means defining at least one cut in said outer



wall, said nipple including a feeding tip at one end and an upstanding locking rib at its opposite end adapted to engage in said channel in the assembled relation, said locking rib and inner and outer walls of said retaining ring being so dimensioned to provide a first circumferentially extending passageway adjacent the lower edge of said inner wall and a second circumferentially extending passageway between said locking rib and the channel.

3,650,271

NIPPLE FOR BABY BOTTLE

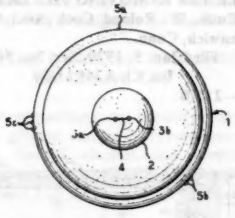
Pierre Pelli, Paris, France, assignor to L'Oreal

Filed June 5, 1970, Ser. No. 43,697

Claims priority, application France, July 29, 1969, 6925828

Int. Cl. A61j *11/00*

U.S. Cl. 128—252 **4 Claims**



Nipple for baby bottle has at least one slot in the portion sucked by the baby. At least one end of at least one slot terminates in a hole having a diameter greater than the width of the slot.

3,650,272

DRAINAGE BAG

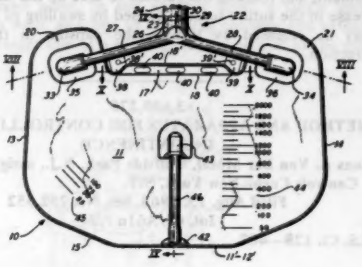
Richard E. Ericson, Keene, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sept. 25, 1970, Ser. No. 75,506

Int. Cl. A61f *5/44*

U.S. Cl. 128—275 **9 Claims**

A closed system urine collection bag having a rigid combined drip chamber and bifurcated inlet tubes having their ends communicating with the bag adjacent opposite upper corners thereof and firmly secured thereto, thereby acting as a spreader to stabilize the form of the bag, the drip chamber and tubes constituting a carrying handle, and the medial upper edge of the bag being further stabilized by a rigid bar



extending horizontally between spaced points of fixation to the inlet tubes.

3,650,273

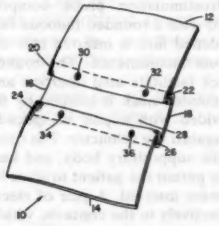
BABY PANTY

Charles H. Schaar, Lake Zurich, Ill., assignor to The Kendall Company, Walpole, Mass.

Continuation-in-part of application Ser. No. 41,377, May 28, 1970. This application Aug. 13, 1970, Ser. No. 63,509

Int. Cl. A61f *13/16*

U.S. Cl. 128—287 **4 Claims**



A panty comprising a sheet of drapable, water-impervious material having at least one tuck in the central portion thereof, in order to define an expandable crotch area is disclosed.

3,650,274

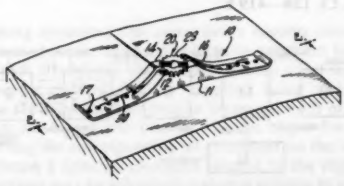
RETENTION SUTURE BRIDGE

Leon C. Edwards, Somerville; Harvey B. Mandel, North Brunswick, and Carl R. Tillstrom, East Windsor Twps., Mercer City, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Oct. 20, 1970, Ser. No. 82,255

Int. Cl. A61b *17/04*

U.S. Cl. 128—335 **6 Claims**



Apparatus for controlling and distributing the tension of retention sutures used in abdominal surgery has a bridging element that may be placed across the surgical incision un-

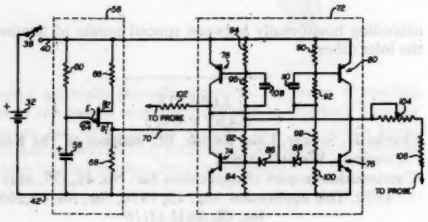
derneath the loosely tied suture. The surgeon obtains the desired suture tension by placing the tied suture within a slot in a positive locking capstan that is mounted on the bridging element, and rotating the capstan to take up the slack. An increase in the suture tension caused by swelling of the wound may be released by turning the capstan in the reverse direction.

3,650,275

METHOD AND APPARATUS FOR CONTROLLING ANAL INCONTINENCE

Hans A. Von Der Mozel, Cliffside Park, N.J., assignor to Bio-Controls Corp., New York, N.Y.

Filed Aug. 13, 1968, Ser. No. 752,352
Int. Cl. A61n *1/34*
U.S. Cl. 128—407 **6 Claims**



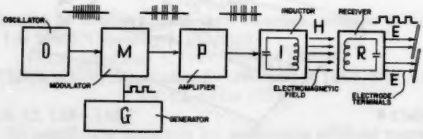
An electrostimulation probe comprising a suppository body formed with a rounded bulbous head, a reduced neck, and a broadened hilt, is inserted into the anus of a patient suffering from incontinence. The rounded bulbous tip and reduced neck facilitate anal insertion and subsequent retention. The rounded neck is clasped by the *sphincter rectalis*, and is provided with a pair of spaced electrical contacts which rest against the sphincter. The broadened hilt limits insertion of the suppository body, and has a substantially flat base so as to permit the patient to sit or lie down comfortably with the device inserted. A pair of electrical leads are connected respectively to the contacts, which are energized by a square wave signal having an average value of zero volts, a peak potential between 1 and 2 volts, and in the frequency range from about 18 to Hertz. 20 hertz. Such electrostimulation causes tonic and physiological contraction of the sphincter muscle, with significant results in the control of incontinence.

3,650,276

METHOD AND APPARATUS, INCLUDING A FLEXIBLE ELECTRODE, FOR THE ELECTRIC NEUROSTIMULATION OF THE NEUROGENIC BLADDER

Theodor Burghele; Vasile Ichim, and Mihai Demetrescw, all of Bucharest, Romania, assignors to Institutul DeMedicina Si Farmacie, Bucharest, Romania

Filed Mar. 25, 1969, Ser. No. 810,167
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 E **10 Claims**



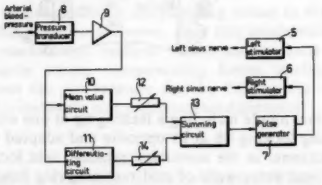
A method for artificial voiding of the bladder involves the introduction of electrodes onto the motor nerves of the bladder, and placing on the anterior wall of the sacrum a receiver means for producing an electric current within such electrodes when excited by an electromagnetic field, and periodically applying an electric and an electromagnetic field from the exterior of the body to said receiver means to induce voiding of the bladder.

3,650,277

APPARATUS FOR INFLUENCING THE SYSTEMIC BLOOD PRESSURE IN A PATIENT BY CAROTID SINUS NERVE STIMULATION

Ulf Hakan Sjostrand, Uppsala, and Per Ake Oberg, Brunna, both of Sweden, assignors to LKB Medical AB, Bromma, Sweden

Filed Feb. 17, 1970, Ser. No. 12,062
Claims priority, application Sweden, Feb. 4, 1969, 2528/69
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 C **6 Claims**



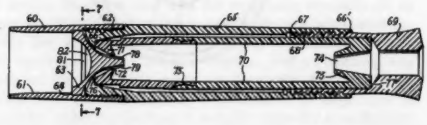
A system for reducing and controlling the blood pressure of a hypertensive patient has electrical pulse stimulation of the carotid-sinus nerves controlled by the arterial blood pressure of the patient in such a manner that the number of stimulation pulses within each heart cycle is determined by the arterial means blood pressure whereas the distribution of stimulation pulses over the heart cycle is a function of the arterial pulse wave shape with the pulse frequency being greater during the first portion of the heart cycle.

3,650,278

ADJUSTABLE TAR REMOVING FILTER FOR SMOKERS

W. Roland Cook, W. Roland Cook Ass., Co. 20 Intervale Place, Greenwich, Conn.

Filed Jan. 5, 1970, Ser. No. 563
Int. Cl. A24f *13/04*
U.S. Cl. 131—215 B **1 Claim**

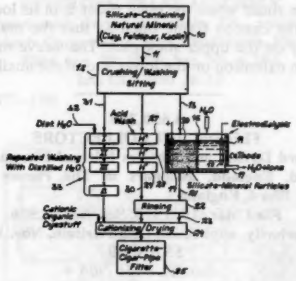


A smoke filter for cigarettes, cigars or pipes employs a manually adjustable needle valve stem in combination with a restricted orifice valve seat axially disposed in one end of a cylindrical condensation chamber. Smoke drawn through the needle valve is compressed and accelerated by its passage through the restricted orifice, and then it expands upon entering the condensation chamber where condensed tars are trapped. One or more lateral grooves formed in the exterior surface of the valve stem prevent complete closure of the needle valve. One disclosed embodiment is in a cigarette holder wherein the condensation chamber is removable and disposable. An alternative embodiment discloses an inexpensive form of the filter attached directly to the tip of a cigarette. A third embodiment discloses a cigarette holder wherein the condensation chamber and mouthpiece are formed of inexpensive molded plastic and are removable as a unit and entirely replaceable.

3,650,279
TOBACCO-SMOKE FILTER AND METHOD OF MAKING SAME

Helmut Gansloser, Constance, Germany, assignor to Otto Wachs, Trostbrucke, Germany

Filed Feb. 13, 1970, Ser. No. 11,182
Int. Cl. A24f *13/06*
U.S. Cl. 131—262 8 Claims



A filter for tobacco smoke consisting of clay, kaolin or feldspars or like aluminum silicate minerals which have been rendered substantially electropositive by an initial cleaning step, preferably by electrodialysis or electrolytic treatment, followed by a cationizing step in which the cationic material is adsorbed onto the mineral particles.

The particles may also be rendered suitable for the filtration of tobacco smoke by subjecting them to an electrophoresis or electrolysis whereby the electronegativity is reduced.

3,650,280
COSMETIC TREATMENT OF HAIR WITH THIOUREA OR UREA AND GLYOXAL

David Roberts, New York, and Leo S. Nasarevich, Jackson Heights, both of N.Y., assignors to David Roberts, New York, N.Y.

Filed Dec. 3, 1969, Ser. No. 881,886
Int. Cl. A61k *7/06*
U.S. Cl. 132—7 10 Claims

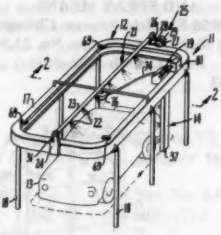
Non-alkaline compositions to beautify hair containing thiourea or urea, glyoxal and an inert cosmetic carrier; and also, preferably, benzyl alcohol and diethylene glycol monoethyl ether. Thin hair is thickened, the molding of thick hair is facilitated and hair is elasticized when treated with the compositions.

3,650,281
AUTOMATIC CARWASH APPARATUS

Mowatt M. Hurst, Menlo Park, Calif., assignor to Malsbary Manufacturing Company, Oakland, Calif.

Filed Dec. 24, 1968, Ser. No. 786,591
Int. Cl. B60s *3/04*
U.S. Cl. 134—58 R 18 Claims

An automatic carwash apparatus of the type having a spray carriage moving around the vehicle on an oblong overhead track, with part or all of the spray onto the car being applied from a spray manifold attached to the carriage. All forms of the invention apply the spray in varying spray volume according to the particular surface portion of the vehicle being sprayed, and all are adapted to change from one spray fluid to another as the carriage circumnavigates the vehicle, for such steps as pre-wetting, soaping, rinsing and waxing. In a number of the embodiments, the spray means used for the top portions of the vehicle is independent of the spray means used for the sides and ends, with one such form having a reciprocal pivoting motion, another having a separate carriage reciprocating along a second track, and then having a second carriage moving along the same track as the first, and still another having spray arms rotating in a horizontal plane about a fixed point. In still another form, a single spray manifold is used, attached to the spray carriage and extending in a straight line in a plane generally normal to the path

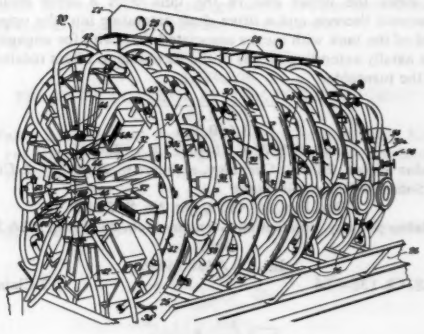


of the portion of the track being traversed. In the single straight line manifold form, the manifold may be horizontal, vertical, slanted, or swingable between vertical and horizontal positions. The straight line manifold is adapted in all forms of the invention to be pivoted for swinging reciprocation about its longitudinal axis to produce a swashing action of the spray against the car.

3,650,282
CONTINUOUS QUENCHING APPARATUS

John R. Hollyer, Warrington, Pa., and Robert A. Andreas, Homewood, Ill., assignors to Drever Company, Huntington Valley, Pa.

Filed Nov. 12, 1969, Ser. No. 875,769
Int. Cl. B05b *3/14*; B08b *3/02*
U.S. Cl. 134—122 10 Claims



A quenching apparatus that comprises a support circumferentially and spacedly disposed relative to an object to be quenched, with a relatively closely spaced array of jet structures to which cooling fluid is supplied being slidably mounted on the support. Anti-friction means on each of the jet structures are biased into contact with the object for adjustably moving the corresponding jet structures on the support to maintain a selected clearance relative to the object. The jet structures may be selectively adjusted relative to each other to accommodate different sized objects to be quenched. The individual jet structures consisting of a jet opening and a fluid directing spoon are disposed at a relatively small angle to the adjacent surface of the object. An axial

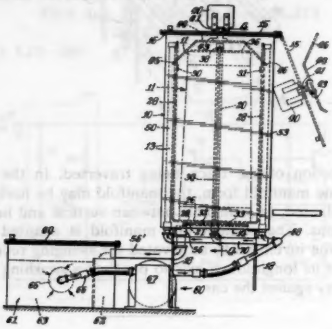
series of supports, each provided with an array of jet structures, has the angle of direction of the jet increasingly inclined to the surface of the object going from the entrance support to the exit support.

3,650,283

FILTER CLEANER HAVING ROTATABLE SUPPORT AND SPRAY MEANS

David C. Lang, 9956 Fairfield Avenue, Chicago, Ill.

Filed Mar. 23, 1970, Ser. No. 21,962
Int. Cl. B08b *3/02, 9/00*
U.S. Cl. 134—143 **5 Claims**



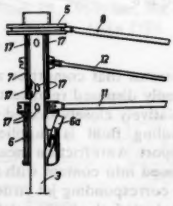
A cleaning apparatus for filters of the cylindrical type used with carburetors of internal combustion engines comprising a tank for receiving cleaning fluid and a plurality of spray means for discharging cleaning fluid therein extending axially into the tank, a turntable adapted to support the filters rotatable about an axis concentric with one of the spray means and the turntable having axially extending means terminating adjacent the upper end of the tank, a cover adapted to close the upper end of the tank with a drive motor mounted thereon and a drive shaft extending into the upper end of the tank with means associated therewith for engaging the axially extending means of the turntable to effect rotation of the turntable.

3,650,284

COLLAPSIBLE UMBRELLA FRAME

Heinz Weber, Hilden, Germany, assignor to Bremshey & Co., Solingen-Ohligs, Germany

Filed Feb. 20, 1969, Ser. No. 800,852
Claims priority, application Germany, Feb. 27, 1968, P 16 32 500.1
Int. Cl. A45b *19/06*
U.S. Cl. 135—26 **2 Claims**



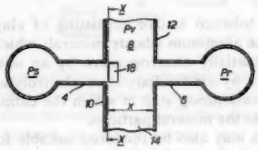
A telescopic umbrella frame comprises at least two telescopic stick parts, the upper of which is nearest to the crown of the umbrella and has the smallest cross-section, and the lower of which is nearest to the handle end of the umbrella and has the greatest cross-section, and a main and an auxiliary slider which slide on the stick and which support a canopy frame, the auxiliary slider sliding on the stick between the main slider and the crown, and the main slider being able to be locked to the stick when the canopy frame is open and having an internal cross-section corresponding to the external cross-section of the lower stick part. The upper stick part is provided with projections or a sleeve adjacent the crown, these projections or sleeve being arranged to fit into the bore of the main slider when the main slider is in its locking position with the canopy frame open so that the main slider is held steady on the upper stick part. The sleeve may be provided by an extension on the lower end of the auxiliary slider.

3,650,285

FLUIDIC JET COLLECTORS

Guy Edward Davies, and Charles Michael Fitzmaurice, both of Ilford, England, assignors to The Plessey Company Limited, Ilford, England

Filed Mar. 25, 1970, Ser. No. 22,576
Claims priority, application Great Britain, Nov. 14, 1969, 55,810/69
Int. Cl. F15c *1/06*
U.S. Cl. 137—81.5 **3 Claims**



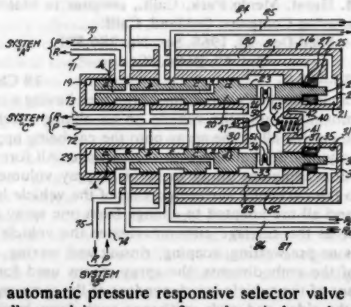
The invention relates to a fluidic device comprising a channel of rectangular section having a rectangular inlet orifice in one of the walls and a rectangular outlet orifice in the opposite wall; the channel acts as a vent. When fluid enters the channel through the inlet orifice, an unrestrained and irreversible expansion takes place. The expansion is accompanied by variation in local pressure due to the interaction of multiple expansion and compression waves which provide the device with a desired input/output pressure characteristic.

3,650,286

HYDRAULIC SELECTOR VALVE

George B. Armstrong, Claremont, Calif., assignor to The United States Government as represented by the Administrator of the Federal Aviation Administration

Filed May 13, 1970, Ser. No. 36,745
Int. Cl. G05d *16/10*
U.S. Cl. 137—87 **5 Claims**



An automatic pressure responsive selector valve for automatically supplying pressure from three independent hydrau-

lic systems, one of which is maintained in a standby status, into two working systems such that in the event of a failure of one of the supply systems the selector valve activates the standby system into a working system; and upon the further failure of a second supply system, the selector valve divides the fluid flow from the remaining pressurized system into the two working systems.

3,650,287

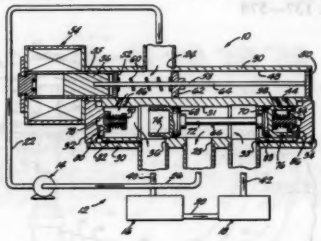
REVERSING VALVE ASSEMBLY

Fred A. Greenawalt, Fort Lauderdale, Fla., assignor to Venture Products Corporation, Fort Lauderdale, Fla.

Filed Jan. 20, 1970, Ser. No. 4,366

Int. Cl. G05d *16/10*

U.S. Cl. 137—106 **6 Claims**



A reversing valve for refrigeration and air conditioning systems which is operable to reverse the flow of refrigerant through the heat exchangers which function as the condenser and evaporator in the system. A solenoid plunger assembly is utilized to control the reversing action, and it is mounted on the reversing valve in an arrangement which minimizes heat loss from the coil and which improves the armature action. An arrangement is also provided to assure desired pressure conditions on opposite sides of moving parts so that more effective operation of the valve occurs.

3,650,288

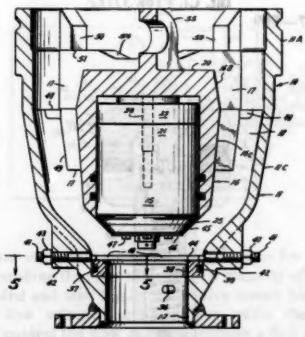
SAFETY RELIEF VALVE

Billy R. Bruton, and Joe B. Locke, both of Longview, Tex., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Feb. 5, 1970, Ser. No. 8,812

Int. Cl. F16k *1/06, 1/12*

U.S. Cl. 137—219 **8 Claims**



A safety relief valve comprises an outer annular body with a relief port through one end, an outlet at the other end, and an annular seat about the relief port. An inner body having ribs extending outwardly therefrom is removably insertable through the outlet into a position within the outer body in which the ribs are seated therein to support the inner body generally concentrically within and spaced from the outer body to provide an annular flow passage between the inner and outer bodies. The end of the inner body facing the relief port is spaced from the seat to provide an annular opening connecting the flow passages, and a closure member is mounted on the inner body for reciprocation between a position seated on the seat to close communication between the flow passages and a position spaced from the seat to open communication therebetween.

3,650,289

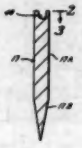
SAFETY RELIEF VALVE

Joe B. Locke, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Feb. 5, 1970, Ser. No. 8,820

Int. Cl. F16k *1/06, 1/12*

U.S. Cl. 137—219 **6 Claims**



A safety relief valve comprises an outer annular body with a relief port through one end, an outlet at the other end, an annular seat about the flow passage through the relief port, and an inner body supported concentrically within and spaced from the outer body to provide an annular flow passage between the inner and outer bodies. The end of the inner body facing the relief port is spaced from the seat to provide an annular opening connecting the annular flow passage with the flow passage through the relief port, and a closure member is mounted on the inner body for reciprocation between a position seated on the seat to close communication between the flow passages and a position spaced from the seat to open communication therebetween.

3,650,290

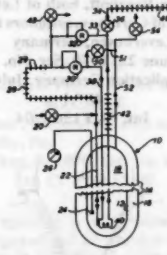
PRESSURE CONTROL SYSTEM FOR CRYOGENIC FLUIDS

Walter B. Moen, Berkeley Heights, and George R. Spies, Murray Hill, both of N.J., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Nov. 19, 1968, Ser. No. 777,048

Int. Cl. F16k *49/00*

U.S. Cl. 137—339 **3 Claims**



Heat for maintaining operating pressure in a single phase cryogen fluid at or above the critical pressure is provided by controllably circulating a portion of the warmed delivery

fluid in heat exchange with the storage fluid. The circulated delivery fluid is reheated and recombined with the remainder of the delivery fluid. A regulator device having a double acting valve element movable between two opposite positions controls flows respectively to a pressuring heat exchanger coil and to a by-pass leading directly to delivery.

3,650,291

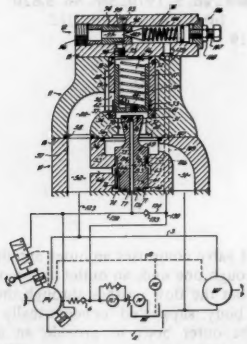
COMBINATION RELIEF AND SHUTTLE VALVE

Cecil E. Adams, and Leo H. Dillon, both of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Original application Oct. 6, 1969, Ser. No. 863,908, now Patent No. 3,583,157. Divided and this application Dec. 9, 1970, Ser. No. 96,506

Int. Cl. F16k *17/22*; F15b *15/18*

U.S. Cl. 137—491 **8 Claims**



A closed loop hydrostatic transmission for transmitting rotary power from a reversible fluid pump to a reversible fluid motor. The transmission includes a novel combination dual relief and shuttle valve operable to relieve excessive pressure from whichever is the higher pressure of two main lines of the loop circuit and to connect whichever is the lower pressure or pump inlet line of the two main lines to a replenishment oil circuit. Two different hydrostatic transmissions are disclosed; one a full boost transmission in which all of the flow from a booster pump is inserted into the closed loop circuit and the other a partial boost transmission in which only makeup oil required for replenishment of oil leakage is inserted into the closed loop circuit.

3,650,292

DEVICE FOR DEFLECTING LIQUID OR GASEOUS MEDIA IN RECTANGULAR DUCTS

Stephan Platz; Peter Herzhoff, both of Leverkusen, and Hans Gref, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 22, 1970, Ser. No. 48,038

Claims priority, application Germany, July 12, 1969, P 19 35 487.1

Int. Cl. F15d *1/04*

U.S. Cl. 137—561 **3 Claims**

Fluid is uniformly distributed from spaced apertures along a distributing duct supplied by a perpendicular feed duct by inserting a perforated angular extension of the feed duct within and across the distributing duct with its central pointed edge in contact with the apertured wall of the distributing duct. A series of uniformly spaced short vanes are mounted parallel to the distributing duct on the outside of the angular extension, which is conveniently made of screen material and attached within the connected ducts by flanges.

3,650,293

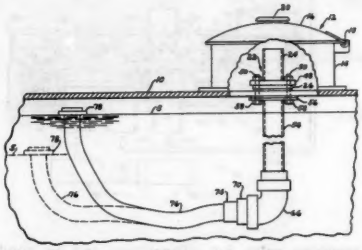
FLOATING VENT FOR RAILWAY TANK CAR SAFETY RELIEVE VALVE

Eugene L. Kunz, Florissant, and Ronald P. Bolte, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 25, 1970, Ser. No. 92,575

Int. Cl. E03b *11/00*

U.S. Cl. 137—578 **4 Claims**



A railway tank car for the transport of liquids has a safety relief valve which is actuated at a predetermined pressure. A float on the outer end of a flexible conduit which communicates with the relief valve permits the flexible conduit to be exposed to gases in the void volume of the tank even when the tank is overturned and the safety valve is on the bottom of the tank shell instead of the top of the tank shell. Excessive gaseous pressures in the tank shell which might occur upon derailments with the tank shell tilted or overturned is communicated or vented directly to the safety relief valve by the end of the flexible conduit which is exposed to the void volume of the tank shell.

3,650,294

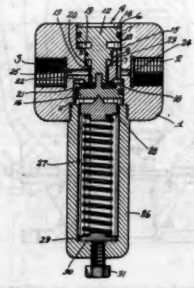
PRESSURE RETAINING VALVE

Kichiro Satoh, 29 Uguisudoni-machi, Tokyo, Japan

Filed Oct. 20, 1969, Ser. No. 867,444

Int. Cl. F16k *31/12*

U.S. Cl. 137—509 **2 Claims**



A pressure retaining valve adapted to retain correctly any predetermined pressure of any fluid and serve as a safety

valve which discharge the fluid to the second side for counter balance when the pressure of the fluid at the first side exceeds the predetermined pressure. The valve comprises a valve casing having an inlet and an outlet for fluid, a vertically disposed axial bore having stepped portions, and an uniquely shaped valve body fitted in the vertical bore, an adjustable spring loaded cylindrical member installed beneath the casing and connected to the vertical bore.

3,650,295

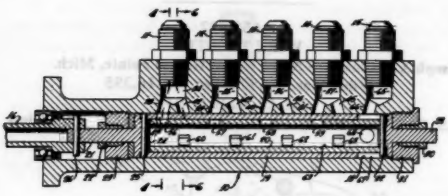
ROTARY VALVE

Richard J. Smith, 8591 Pyle Way, Midway City, Calif.

Continuation of application Ser. No. 677,223, Oct. 23, 1967, now abandoned. This application Apr. 20, 1970, Ser. No. 31,815

Int. Cl. F16k *11/20*

U.S. Cl. 137—614.17 **11 Claims**



A rotary valve including a housing having a chamber within which rotates a sleeve having at least one port for intermittent communication with a discharge port in the chamber, and a second sleeve within the first having a port adapted for communication with the port in the outer sleeve, the second sleeve being adjustable in its rotational position to control cutoff. An adjustable ported sleeve may be provided outside the rotor sleeve for controlling the timing.

3,650,296

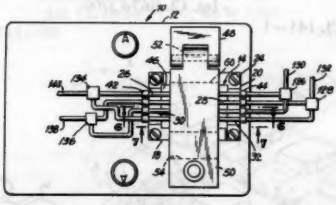
APPARATUS FOR SIMULTANEOUSLY CONTROLLING THE FLOW OF FLUIDS IN A PLURALITY OF FLOW PATHS

Carl V. Johnson, Baldwin, and Reino Leisio, Bronxville, both of N.Y., assignors to Technicon Corporation, Tarrytown, N.Y.

Filed Sept. 22, 1969, Ser. No. 864,262

Int. Cl. F16k *11/00*

U.S. Cl. 137—624.18 **2 Claims**



New and improved method and apparatus for simultaneously controlling the flow of fluids in a plurality of flow paths are provided and take the form of valve means having a plurality of low volume, separate flow paths therethrough, means to control the flow of fluids through a first plurality of said flow paths, means to control the flow of fluids through a second plurality of said flow paths, and actuation means to actuate said fluid flow controlling means in such manner that said respective pluralities of fluid flow paths are never simultaneously closed, and are simultaneously opened only for the briefest period of time to respectively prevent pressure build-up upstream of the valve means and to insure an extremely low hold-up volume within the valve means resultant near perfect fluid flow cut-off or separation characteristics through the valve means.

3,650,297

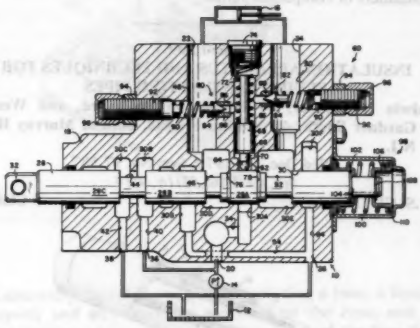
SPOOL RELEASE AND SEQUENCE VALVE

Glenn R. Hubbard, Racine, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed Sept. 30, 1970, Ser. No. 76,686

Int. Cl. F15b *13/01*

U.S. Cl. 137—624.27 **12 Claims**



A hydraulic valve includes a spool movable from an inactive position to a pair of operating positions in each of which one of a pair of motor ports is pressurized. A detent latches the spool in its operating positions, and a spring biased plunger normally urges the detent into engagement with the spool. One side of the plunger is exposed to valve inlet pressure, and normally the plunger is maintained in hydraulic balance by means of restricted communication between its two sides. A pair of pressure responsive valves communicate between the second side of the plunger and the motor ports, and are independently adjustable to open at predetermined pressures thereby to unbalance the plunger and release the spool from the operating positions. The valve may be provided with a centering spring so that upon release the spool returns to its inactive position. Alternatively, the valve is provided with a reversing spring arrangement serving to reverse the operation of the valve when the spool is released from a first operating position so that a pair of operations are automatically carried out in sequence. A system including two or more valves carries out several hydraulic operations in sequence.

3,650,298

CARTRIDGE PACK FOR TRASH COMPACTION MACHINE

John Kenneth Delmar, Havertown, Pa., assignor to Crystal-X Corporation, Darby, Pa.

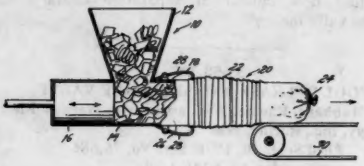
Filed Aug. 6, 1970, Ser. No. 61,693

Int. Cl. F16l *55/00*

U.S. Cl. 138—103 **5 Claims**

A cartridge comprising a compressed plastic tube for mounting on the tapered end of a hollow cylindrical member into which solid waste or refuse is rammed so that the tube can subsequently be tied and cut into relatively small units containing slugs of compacted refuse. The plastic tube comprises elongated sections, generally about 2 ft. in length, interconnected by external folds, sealed at their bases, so that

after a length of tube, such for example as 32 ft., is filled with slugs of compacted refuse, the folds can be readily pulled

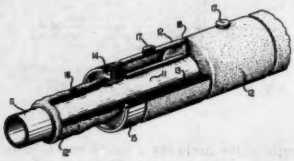


open, tied, and severed between the ties to form 2 ft. plastic containers of compacted refuse.

3,650,299
INSULATION APPARATUS AND TECHNIQUES FOR FLUID-TRANSMITTING PIPES

Edwin Nail Seiler, 80 Hunterdon Boulevard, and Weaks Gardner Smith, 48 Southgate Road, both of Murray Hill, N.J.

Filed Dec. 14, 1970, Ser. No. 97,587
Int. Cl. F16l *55/16, 9/14*
U.S. Cl. 138—149 **5 Claims**



Pipes for transmitting petroleum across permafrost earth are insulated by a succession of inflatable tubular bag members. The bag members are inflated by forcing into them insulative material under air pressure. When the pipes transmit petroleum, the average density of the pipe and inflated bag members is smaller than that of the permafrost earth. Thus, if the permafrost should melt, the insulated pipe would float rather than undergoing serious stresses that would otherwise occur.

3,650,300
FIRE RETARDANT POLYOLEFINS

Gregory Julius Listner, Kendall Park, N.J., assignor to Johnson & Johnson

Continuation-in-part of application Ser. No. 706,986, Feb. 20, 1968. This application Oct. 31, 1968, Ser. No. 774,222
Int. Cl. C08f *45/58;* **C09k** *3/28*
U.S. Cl. 139—420 **24 Claims**

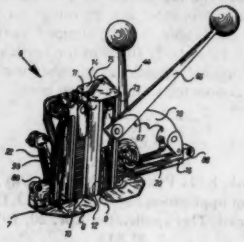
This invention relates to poly-α-olefin compositions made fire retardant by the addition thereto of an antioxidant, a bromine or a chlorine phosphate, a free radical initiator, and a dispersant.

3,650,301
COMBINATION TOOL FOR AFFIXING A SEAL TO STRAPPING

Thomas J. Karass, 411 Kindersley Avenue, Mount Royal, Quebec, Canada

Filed Jan. 6, 1970, Ser. No. 1,009
Int. Cl. B21f *9/02*
U.S. Cl. 140—93.4 **8 Claims**

A manually-operable tool which tensions a strap around a package or container and applies and crimps a seal around the strapping and which, finally, cuts the strapping behind

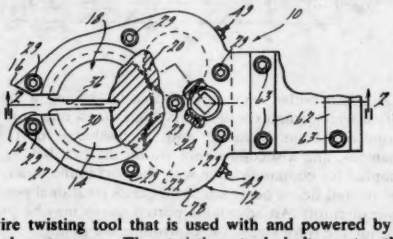


the seal. The seals or connector elements are automatically fed from a magazine.

3,650,302
WIRE TWISTER

Joseph X. Palms, 873 Notre Dame, Grosse Pointe, Mich.

Filed Mar. 4, 1970, Ser. No. 16,395
Int. Cl. B21f *15/04*
U.S. Cl. 140—119 **6 Claims**

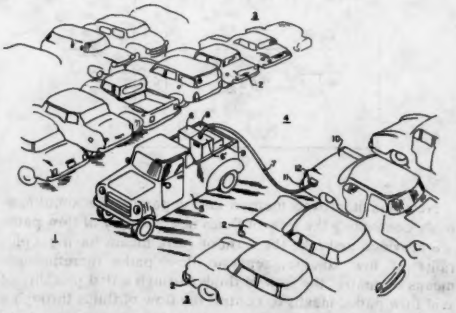


A wire twisting tool that is used with and powered by a standard nutrunner. The twisting tool bolts onto the nutrunner and has a radially slotted twisting gear to receive the wires to be twisted. The slotted gear is rotated through intermediate gearing driven by the driver of the nutrunner. The nutrunner is of the right angle drive type, so that the axis of its driver is parallel to the axis of the twisting gear.

3,650,303
METHOD AND APPARATUS

Robert R. Chambers, Scarsdale, N.Y., and Rudolph S. Stokan, Harvey, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 2, 1970, Ser. No. 19
Int. Cl. B67d *5/00*
U.S. Cl. 141—1 **15 Claims**



A new method and apparatus for filling a vehicle gasoline tank and automatically recording the identity of the vehicle

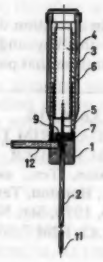
and the amount of gasoline added is disclosed. These systems are further useful in a method for periodically maintaining a group of vehicles which are parked for a relatively long time as in a daily parking lot. The vehicles can thus be maintained with gas, oil, etc., without the necessity for the owner or driver being present.

3,650,304

MERCURY DOSAGE DEVICE

Aito Kasimir Airola, and Martti Kaarlo Johannes Saarinen, both of Helsinki, Finland, assignors to Oy Airam Ab, Helsinki, Finland

Filed Apr. 13, 1970, Ser. No. 27,599
Claims priority, application Finland, Apr. 18, 1969, 1138/69
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—2 7 Claims



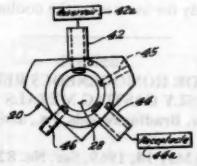
The mercury dosage device consists of a supporting tube in a holder and a capillary tube fitted inside this supporting tube and in which the upper end of the capillary tube has been connected to means for producing combined suction and blowing action. The magnitude of the dose is determined by the position of the lower end of a stem movable longitudinally within the capillary tube. The outer diameter of the stem is smaller than the inner diameter of the capillary tube in such amount that the suction and blowing effect on the mercury is easily produced but that the mercury cannot enter the space between the stem and the capillary tube.

3,650,305

VALVE FOR DISPENSING MEASURED QUANTITIES OF LIQUID

Richard E. Hendershot, Los Angeles, Calif., assignor to Harvey Dental Specialty Company, Gardena, Calif.

Filed Jan. 29, 1970, Ser. No. 6,827
Int. Cl. B65b *31/00*; B67c *3/00*
U.S. Cl. 141—50 11 Claims



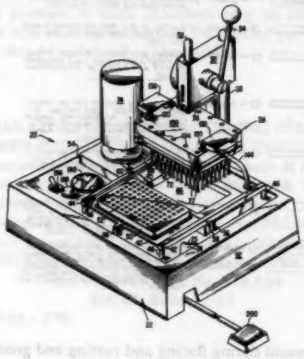
A valve is equipped with a measuring chamber to release predetermined increments of liquid into a pressurized receptacle, the valve having a first limit position for filling the metering chamber from a liquid reservoir, a second opposite limit position for emptying the measuring chamber into the receptacle, a third intermediate position to vent the metering chamber and a fourth position in its range of positions to vent the receptacle.

3,650,306

LABORATORY DISPENSING APPARATUS

Jesse F. Lancaster, Great Falls, Va., assignor to Cooke Engineering Company, Alexandria, Va.

Filed Sept. 18, 1970, Ser. No. 73,505
Int. Cl. B65b *3/30*; B01j *4/02*
U.S. Cl. 141—238 18 Claims



Laboratory dispensing apparatus including a base, a liquid reservoir and well assembly mounted on the base, and a microtitration plate carrier device mounted on the base for reciprocating movement between a forward retracted position and a rearward operative position overlying a portion of the well. A vertically movable pipette dispensing assembly is positioned above the base in operative alignment with the portion of the liquid well so that with the carrier in the forward retracted position the plural pipettes may withdraw microquantities of liquid from the well and then dispense the same into the microtitration plate wells when the carrier is moved to the rearward position. The plural pipettes are supported and contained in a head unit which is readily removable from the dispensing assembly to permit quick changing of heat units for cleaning purposes.

A liquid agitator assembly is associated with the liquid reservoir and well assembly to circulate and stir the liquid and thereby insure uniformity and homogeneity of the liquid being dispensed by the plural number of pipettes. An electrical and pneumatic control system operates the stirring assembly and dispensing assembly, with the various control elements and components being mounted within the base structure of the dispensing apparatus to provide a compact self-contained portable system.

3,650,307

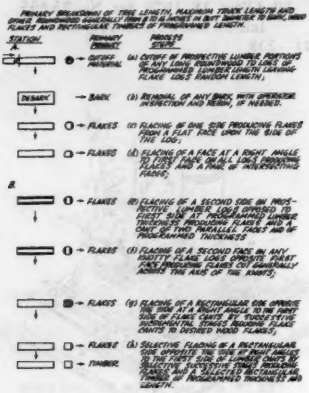
APPARATUS FOR PRIMARY BREAKDOWN OF ROUNDWOOD

Donald L. Johnson, 1816 N. Lenore Drive, Tacoma, Wash.

Original application Apr. 12, 1967, Ser. No. 635,639, now Pat. No. 3,472,296. Divided and this application Sept. 25, 1969, Ser. No. 860,970
Int. Cl. B27c *9/00*
U.S. Cl. 144—3 R 23 Claims

A unified primary flacer mill for the selective reduction of roundwood to bark, bolts for decorative veneer, wood flakes or chips, lumber and timbers for use as such or for subsequent reduction to flat sliced rectangular veneer. The mill consists of two independent systems for producing bark and flakes or chips. Thinnings and other small wood to 8 inches in diameter are delivered to one station. Larger roundwood possibly suitable for lumber or timbers is delivered to other

stations. Flaking or chipping and surfacing heads replace saws for all outside cuts. Apparatus provides adequate support for the wood during flacing and parting and good operator view of the work for selective breakdown.

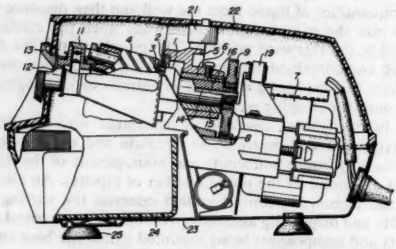


3,650,308

ELECTRIC PENCIL SHARPENER

Takeo Hori, Fukuoka-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 16, 1969, Ser. No. 858,469
Claims priority, application Japan, Sept. 20, 1968, 43/69026
Int. Cl. B43l *23/02*
U.S. Cl. 144—28.5 **4 Claims**



An electric pencil sharpener including an ON-OFF switch by means of which the sharpener can be adjusted to sharpen a pencil to a desired sharpness. The pencil sharpener is provided with a slidable rod which is adapted to be displaced by the pencil lead tip as the pencil is being sharpened, the slidable rod being so arranged that its displacement is effective to actuate another switch to automatically stop the motor of the sharpener.

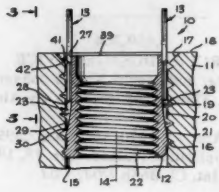
3,650,309

STRUCTURE AND USE OF FASTENERS HAVING LOCKING KEYS

Robert Neuschotz, 1162 Angelo Drive, Beverly Hills, Calif.

Filed Feb. 12, 1969, Ser. No. 798,686
Int. Cl. F16b *39/06*
U.S. Cl. 151—23 **12 Claims**

A fastener including a threaded body to be connected to a coacting part, and a locking key received at least partially within a groove formed in the body, with the key being adapted to be driven generally axially relative to the body to a locking position, and with the groove being shaped to direct the key radially with respect to the axis of the thread and toward the material of the coacting part as the key advances generally axially, in a relation deforming the material of the coacting part by the key and thereby locking the thread against detachment from that part.

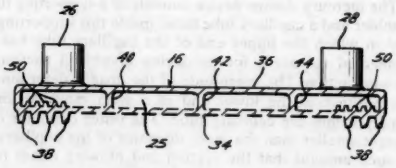


3,650,310

COMBINATION BOAT TRIM TAB AND HEAT EXCHANGER

Ezra E. Childress, Houston, Tex., assignor to Stewart & Stevenson Services, Inc., Houston, Tex.

Filed July 16, 1970, Ser. No. 55,427
Int. Cl. F28f *7/00*
U.S. Cl. 165—44 **5 Claims**



A combination boat trim tab and heat exchanger for an engine driven boat in which the trim tab body is hollow and has an inlet and outlet connected to the hollow interior and is adapted to be connected to the boat engine cooling system with elongate fins secured to the bottom of the outside of the body and axially aligned with the longitudinal axis of the boat. The hollow interior of the body including a serpentine passageway between the inlet and outlet thereby increasing the heat exchange area in contact with the engine cooling liquid. Elongate cooling fins secured to the interior of the bottom of the body for increasing the cooling surface.

3,650,311

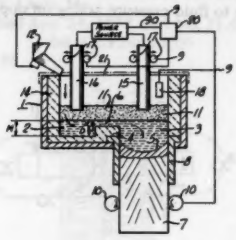
METHOD FOR HOMOGENEOUS REFINING AND CONTINUOUSLY CASTING METALS AND ALLOYS

Gale Ray Fritsche, Bradfordwoods, Pa., assignor to Sandel Industries, Inc.

Filed May 14, 1969, Ser. No. 824,589
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 **20 Claims**

A process and apparatus for electroslag remelting to metallurgically refine and cast metal alloys in a controlled environment and confined area under electroslag, consisting of an electro-energized molten flux bath blanketing the molten metal bath. The original constituents of the metal alloys are fed, in a heated or unheated state, to the area of the molten bath until they have been melted and converted into a metallurgically refined molten alloy, and then the refined molten

alloy is withdrawn from the confined feeding area to form a product such as by continuous casting.



The principal feature, therefore, is the continuous blending and refining to produce a super alloy ingot that possesses low impurity level and has good grain structure.

The confined, offset or laterally disposed feeding of the metal alloy entraps any unmelted materials and insured only the casting of the liquified molten metal and permits more accurate control of the different areas of the melt as well as the control of the thermodynamics of the liquid-solid interface formed in the continuous casting area.

3,650,312

HYBRID CASTING-HOT WORKING PROCESS FOR SHAPING MAGNESIUM, ALUMINUM, ZINC AND OTHER DIE CASTING METALS

Lloyd R. Allen, 480 Pleasant Street, Belmont, Mass.

Filed Sept. 14, 1970, Ser. No. 72,214
Int. Cl. B22d *27/20*
U.S. Cl. 164—55 **10 Claims**

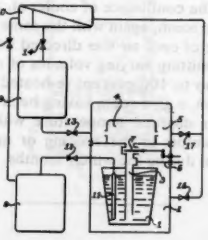
Molten metal is thickened by addition of high surface area aerogel powder to produce a thixotropic mass which is workable at low working forces and retains its worked shape after removal of the applied working forces. Cooling to below melting temperatures solidifies the mass into a product having the metallurgical-structural characteristics of a forged metal notwithstanding the use of casting methods in fabrication.

3,650,313

METHOD FOR THE PRODUCTION OF CASTINGS FROM ALLOYS OF METALS AND GASES

Angel Tontchev Balevski, and Ivan Dimov Nikolov, both of Sofia, Bulgaria, assignors to Institut po Metaloznanie i Technologina Metalite, Sofia, Bulgaria

Filed Oct. 2, 1969, Ser. No. 863,153
Claims priority, application Bulgaria, Oct. 9, 1968, 10785
Int. Cl. B22d *27/20*
U.S. Cl. 164—55 **4 Claims**



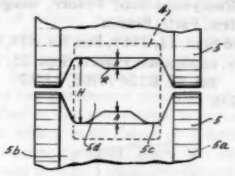
Method of and apparatus for dissolving a gas in molten metal and casting the metal in that condition. During the casting process a reservoir with the melt and the mold for the casting are disposed in separate chambers, such chambers being subjected to the pressure of an atmosphere composed by the gas to be dissolved in the molten metal and some other gas which is inert to the metal, the gases being present in such proportion that the partial pressure of the gas to be dissolved in the chamber with the mold is higher than that in the chamber with the reservoir for the melt. Thus, the solubility of the gas, which depends upon its partial pressure, may be equal in the melt, as well as in the solidifying metal; the total gas pressure in both chambers may be chosen in accordance with the requirement of the casting process, so that the melt may be conveyed to the mold.

3,650,314

APPARATUS FOR MANUFACTURING STRETCH-FORMED PRODUCTS OF HIGH-MELTING METALS

Bruno Tarmann, and Heinrich Vonbank, both of Kapfenberg, Austria, assignors to Firma Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria

Continuation-in-part of application Ser. No. 586,494, Oct. 13, 1966, now Patent No. 3,491,823, and a continuation-in-part of 632,001, Apr. 13, 1967, now abandoned. This application Nov. 19, 1969, Ser. No. 878,064
Int. Cl. B22d *11/12*
U.S. Cl. 164—270 **7 Claims**



An apparatus for the manufacture of strands of molten metal, in particular nonalloyed and alloyed steels, by continuous casting, comprising a mold for continuously casting a strand and means for simultaneously withdrawing the cast strand from the mold. The cast strand which exits from the mold is in a partially solidified state and has a molten core. The withdrawing means comprise a pair of spaced grooved rollers which define a box-pass therebetween. The bottom of the groove of each roller includes a convexedly curved portion, the camber of convexity of which amounts to 10–25 percent of the height of the box-pass. Pressure producing means are operatively connected to the pair of grooved rollers. This pressure producing means being selectively variable in applying pressure at ratios ranging from 1:4 to 1:8.

3,650,315

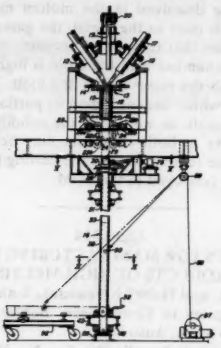
APPARATUS FOR WITHDRAWING A CASTING FROM A MOLD

Eugene V. Abarotin; Thomas E. Nicely, both of Franklin Township, Westmoreland County, and Robert A. Wilshire, Jr., Monroeville Borough, all of Pa., assignors to United States Steel Corporation

Filed May 22, 1970, Ser. No. 39,749
Int. Cl. B22d *11/12, 11/08*
U.S. Cl. 164—274 **6 Claims**

A method and apparatus for withdrawing a casting from an open-ended mold. The apparatus comprises a starter bar connected to a platform movable along platform guides, and a platform propelling mechanism. The apparatus has electrical connections through the starter bar, and it is capable of

precise control. The method comprises inserting a starter bar in the mold, starting the casting process, connecting the



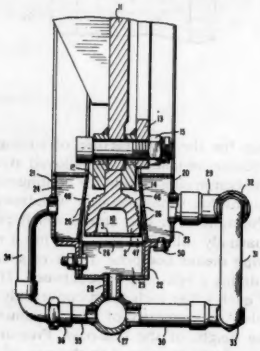
product to the starter bar, withdrawing the product and severing the product from the starter bar.

3,650,316

COOLING APPARATUS FOR CONTINUOUS CASTING WHEEL

Robert Petit, Rosny-sous-Bois, France, assignor to Societe Nouvelle Spidem, Paris, France

Filed Sept. 22, 1969, Ser. No. 859,720
Claims priority, application France, Sept. 25, 1968, 167603
Int. Cl. B22d *11/06, 11/12*
U.S. Cl. 164—278 **5 Claims**



A U-shaped, multi-compartment casing surrounds a grooved rim of a rotating casting wheel which cooperates with a metal belt to define a continuous casting cavity on the rim periphery with the compartments subjected to a continuous flow of cooling fluid.

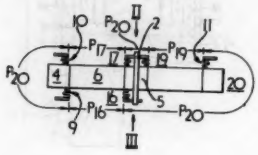
3,650,317

ROTARY REGENERATIVE HEAT EXCHANGER

Mark Carey Sedgwick Barnard; Hugh Christopher Bramley, and Peter Jacobus Collet, all of c/o Leyland Gas Turbines Limited, Meteor Works, Lode Lane, Solihull, Warwickshire, England

Filed June 8, 1970, Ser. No. 44,259
Claims priority, application Great Britain, June 11, 1969, 29,487/69
Int. Cl. F28d *19/04*
U.S. Cl. 165—9 **3 Claims**

A rotary regenerative heat exchanger in which inlet and outlet seals defining a path for one or other of the fluids between which heat is to be exchanged enclose respective areas of inlet and outlet end faces of the matrix of the heat exchanger of different magnitude, thereby to reduce the magnitude of the resultant axial force on the matrix. In this way forces due to fluid pressure acting on opposed end faces



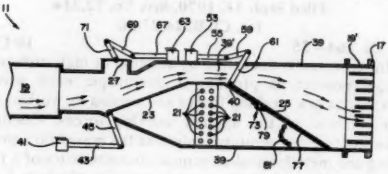
of the matrix can be balanced thereby to reduce stress within the matrix and also to avoid wear on the seals due to an unresolved end thrust on the matrix. Additionally, the areas of the seals can be adjusted to avoid tipping of the matrix about its axis of rotation.

3,650,318

VARIABLE VOLUME CONSTANT THROW TERMINAL RE-HEAT SYSTEM

Gilbert H. Avery, 1475 Central Avenue, Memphis, Tenn.

Filed Nov. 19, 1970, Ser. No. 91,072
Int. Cl. F24f *3/06*
U.S. Cl. 165—22 **10 Claims**



A system for temperature conditioning the air of a room in a building. The system is particularly directed towards eliminating drafty conditions and/or uncomfortable temperature variations, predominantly noticeable heretofore as the typically conventional system cycles during the summer months in operable response to a thermostatic switch located in the room. Some of the features of the present invention contributing towards the accomplishment of the above include structure for by-passing variable volumes of the supply air away from the room while forcing the remaining volume of air into the room with the same velocity as when the total volume of air was directed into the room, structure for re-heating a portion of the aforementioned reduced volume of cool air so that the confluence of cooler air and re-heated air is forced into the room, again with the same velocity as when the total volume of cool air was directed into the room, and structure for admitting varying volumes of re-heated air into the room, i.e., up to 100 percent re-heated air, for warming an overcold room, e.g., a room having been cooled to a comfortable summer daytime temperature which is considered too cool for comfort in the evening or nighttime, and for heating the room during the winter months.

ERRATUM

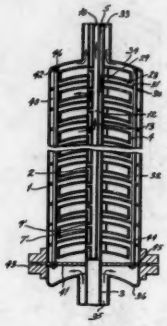
For Class 165—44 see:
Patent No. 3,650,310

3,650,319

HEAT EXCHANGE DEVICE

George B. Boon, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 24, 1970, Ser. No. 31,467
Int. Cl. F28d 11/00
U.S. Cl. 165—88 5 Claims



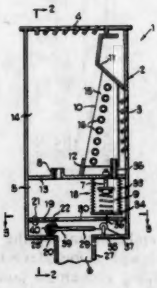
A heat exchanger for a product fluid comprises a rotor and a shell, one of which rotates. The rotor comprises a hollow shaft and hollow disk-like members attached to and communicating with the shaft which members and shaft form a tortuous conduit for a heat transfer fluid. The hollow disk-like members are not flat but have their central openings which attach to the shaft displaced above their distal edges. Similarly shaped disk-like partitions attached to the shell by support means and interleaved with the hollow disk-like members form together with the shell, rotor shaft, and hollow disk-like members a second tortuous conduit for a product fluid which product fluid is separated from the heat transfer fluid by the heat conductive walls of the rotor shaft and hollow disk-like members. The heat exchanger is particularly useful for conducting a reaction of a high viscosity liquid under closely controlled temperature conditions and continuous agitation.

3,650,320

INDUCTION UNIT CONTROL SYSTEM

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 30, 1970, Ser. No. 33,448
Int. Cl. B60h 1/00
U.S. Cl. 165—40 10 Claims



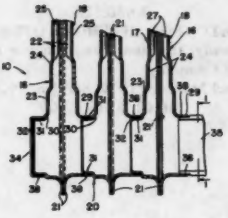
The individual induction units employed in a multi-room air conditioning system are each provided with a damper for varying the flow of the primary air into the induction unit. This damper is automatically controlled in response to the pressure differential across the nozzle plate, that is between the pressure existing inside the primary air supply plenum, and the ambient pressure.

3,650,321

SHEET METAL RADIATOR ASSEMBLY

Kenneth L. Kaltz, Lansing, Mich., assignor to Tranter Manufacturing, Inc., Lansing, Mich.

Continuation of application Ser. No. 679,398, Oct. 31, 1967. This application Nov. 21, 1969, Ser. No. 872,454
Int. Cl. F28d 15/00
U.S. Cl. 165—106 8 Claims



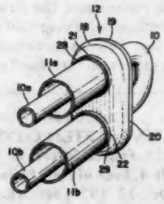
A multi-plate radiator assembly features a longitudinally spaced series of hollow, generally flat heat transfer plates, each provided with integral formations which afford circulating headers at opposite ends of each plate, the plate and header units being composed of a pair of sheet metal stampings. The two component stampings of each unit differ from one another in that one thereof is formed at its header-affording ends with a male flange of cylindrical shape and predetermined outer diameter; while the other stamping of the pair is formed in axially aligned comparable zones to provide a female cylindrical flange of an internal diameter equaling the O.D. of the male flange of the next adjacent plate and header-forming unit of the series. Successive units are telescopingly associated with one another at the male and female flanges thereof, and a union of male and female flanges is completed and made liquid tight by a copper solder connection.

3,650,322

HEAT EXCHANGER

Nicholas Marie De Munnik, 450 Walmer Road, Apt. 409, Toronto, Ontario, Canada

Filed June 22, 1970, Ser. No. 48,160
Int. Cl. F28f 9/26
U.S. Cl. 165—143 6 Claims



The following specification discloses an improved heat exchanger for cooling semi-solids and particularly provides a coolant jacket connector means constructed of stainless steel sheet metal capable of withstanding the expansion and contraction forces caused by the heat transfer from a mash tube to the jackets at the attachment point of the tube and jackets.

The connector comprises a pair of oval-shaped sheet metal stampings each being dished to form an upwardly curved edge. The curved edges are mated and welded together to form a rounded hollow elongated body. Each of the pair of oval-shaped dished sheets has a pair of circular openings with a flanged collars punched outwardly from the bottom of the dished sheet remote from the upwardly dished edge.

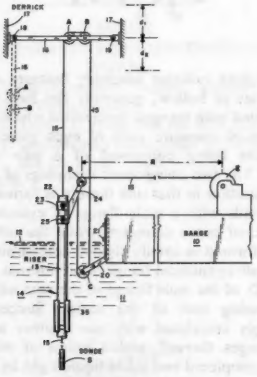
The pair of flanged openings on one side of the connector are dimensioned to fit over the ends of a pair of jackets and the pair of flanged openings on the other side of the connector are dimensioned to fit over adjacent lengths of a twist or turn of the mash tube.

3,650,323

APPARATUS FOR OFFSHORE OPERATIONS

William E. Kanady, Houston, Tex., assignor to Esso Production Research Company

Filed Mar. 13, 1970, Ser. No. 19,368
Int. Cl. E21b *47/00*
U.S. Cl. 166—.5 **11 Claims**



Apparatus is provided for use in a well from a floating vessel involving suspension means mounted on a vessel above the well in fixed relationship to the well such that flexible means may run into the well from the vessel over the suspension means and over first and second means which are attached to the vessel and the well respectively to provide parallel vertical runs between the first means and the suspension means, between the suspension means and the well, and between the second means and the first means, the vessel having a well tool such as a logging tool suspended from the flexible means in the well and running from the second means horizontal to means on the vessel operating the tool.

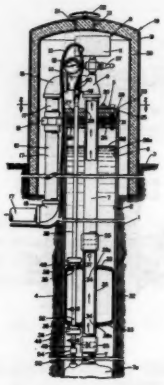
3,650,324

WELL PUMPING SYSTEM CONSTRUCTION

Paul R. Randles, 831 Fourth Street, S. W., and Edward R. Wisintainer, Route 4, both of New Philadelphia, Ohio

Filed Oct. 12, 1970, Ser. No. 80,014
Int. Cl. E21b *43/00*; F04b *49/08*
U.S. Cl. 166—68.5 **11 Claims**

A well pumping system construction having top and bottom seals spaced within a well casing or well shaft forming a combination water storage and air pressure tank chamber therein. A water delivery pipe communicates with and extends through the tank chamber and is connected at the lower end to a pump and is connected at the upper end to a water supply line above the well casing. Pump controls are located at top of the delivery pipe above the well casing and are enclosed by a protective housing. A conduit within the well casing provides the means for inflating the bottom seal,



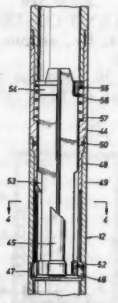
provides a well breather passage, and contains the electrical wires for the pump.

3,650,325

WELL BRIDGING APPARATUS HAVING A DETACHABLE SETTING MEANS

Nevyl G. Owens, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Original application Apr. 22, 1969, Ser. No. 819,515, now Patent No. 3,556,215, dated Jan. 19, 1971. Divided and this application Apr. 20, 1970, Ser. No. 38,621
Int. Cl. E21b *23/06*
U.S. Cl. 166—182 **3 Claims**



An illustrative embodiment of the present invention in through tubing bridge plugs includes a body member carrying an expansible bridging element, a pump and receptacle assembly releasably coupled to the body member and adapted to contain a cementitious material that can be displaced from the receptacle to expand the bridging element, a vent passage through the body member to enable fluid movement within the well bore without disturbing the cementitious material as it hardens, and valve means automatically operable after a pre-selected time delay for closing off the vent passageway.

3,650,326

HYDROCARBON RECOVERY EMPLOYING AQUEOUS MEDIUM DRIVING FLUID HAVING INCREASING VISCOSITY

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed May 25, 1970, Ser. No. 40,412
Int. Cl. E21b *43/22*
U.S. Cl. 166—246 11 Claims

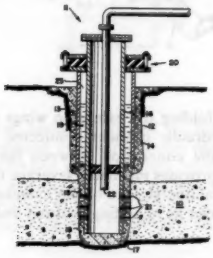
Hydrocarbons are recovered from a subterranean hydrocarbon containing formation by injecting an aqueous medium driving fluid through said formation to displace hydrocarbons therefrom. The aqueous medium driving fluid comprises a bacterial cellular solution that has been treated for providing a driving medium whose viscosity increases during displacement to the formation.

3,650,327

THERMAL INSULATION OF WELLS

Floyd D. Burnside, Littleton, Colo., assignor to Shell Oil Company, New York, N.Y.

Filed July 14, 1970, Ser. No. 54,720
Int. Cl. E21b *33/14, 43/24*
U.S. Cl. 166—303 5 Claims



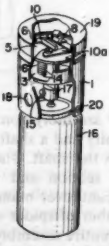
A method for thermally insulating a well, such as a steam injection well or a well which produces oil through permafrost formations, by filling an annular space between two strings of casing in the wells with heat insulating vermiculite slurry.

3,650,328

DEVICE FOR AUTOMATICALLY ACTUATING A GAS DISCHARGE VALVE OR THE LIKE

Yu Fujiki, and Hiroshi Tsubaki, both of Tokyo, Japan, assignors to Ricoh Watch Co., Ltd., Nagoya-shi, Aichi-ken, Japan

Filed Apr. 15, 1970, Ser. No. 28,613
Claims priority, application Japan, Apr. 18, 1969, 44/35617
Int. Cl. A62c *37/06*
U.S. Cl. 169—19 5 Claims



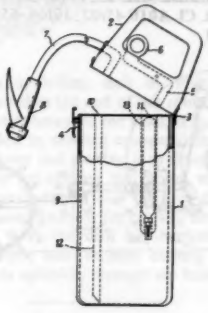
Actuating means for actuating a discharge valve of a gas tank or the like is normally held in a stationary valve deactuated position by detent means. The detent means is normally held in a retaining position by a fusible metal link. When the link is fused, by an environmental temperature rise, the detent means is displaced to a releasing position at a right angle to the direction of movement of said actuating means, thereby permitting said actuating means to actuate the valve.

3,650,329

REFILLABLE FIRE EXTINGUISHER

Frederic Sachs, Neuilly-sur-Seine, France, assignor to Compagnie Centrale Sicli Societe Anonyme, Seine Saint-Denis, France

Filed Aug. 18, 1970, Ser. No. 64,686
Claims priority, application France, Aug. 20, 1969, 6928523; July 17, 1970, 7026356
Int. Cl. A62c *13/40*
U.S. Cl. 169—31 P 2 Claims



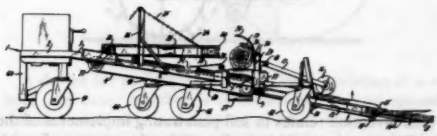
A fire extinguisher or the like spraying apparatus wherein a mechanically resistant container is adapted to receive through its upper or lower end a cartridge made of a sheet showing no great mechanical resistance and enclosing a refill mass of material to be sprayed and/or a bottle of compressed gas the container being provided with means for perforating the bottle whether inside the cartridge or adjacent the latter inside the container. The gas pressure when released causes the diaphragms to burst, allowing the escape of the mixture to be sprayed, to burst. A fire extinguisher of this type can be refilled speedily several times in succession.

3,650,330

SOD PICK-UP MACHINE

Robert G. Gieringer, 6508 N. Sunny Point Road; Robert H. Gieringer, and William A. Gieringer, both of 5485 N. Port Washington Road, all of Milwaukee, Wis.

Filed Aug. 6, 1969, Ser. No. 847,898
Int. Cl. A01b *45/04*
U.S. Cl. 172—19 6 Claims



A sod pick-up machine having a floating sod pick-up unit comprising independently pivotable elements including a tongue, inclined conveyor and sod hold-down wheel. A fixed conveyor cooperates with a hanging pivotal conveyor to roll a length of sod and move the latter downwardly to a transverse discharge conveyor. The hanging conveyor may be ad-

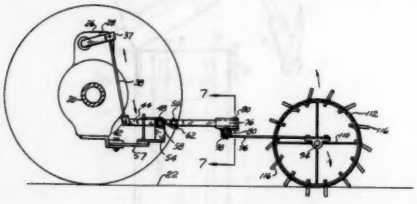
justed as to height. A separator plate permits downward movement of a sod roll over a length of flat sod. The discharge conveyor includes a channel having a rear curb wall and an adjustable front rail. Tandem wheels are mounted on arms which are pivotally mounted beneath the discharge conveyor. A separate tractor drives the machine and is connected thereto by a floating shock-absorbing system at the front and fixed pivot at the rear. Relative vertical movement is permitted at the front, and relative pivotal movement on a longitudinal axis is permitted.

3,650,331

TRACTOR HAVING HITCH ASSEMBLY FOR MOUNTING A PLURALITY OF IMPLEMENTS

Arnold A. Dedoes, 2070 W. Eleven Mile Road, Berkley, Mich.

Continuation-in-part of application Ser. No. 795,853, Feb. 3, 1969, and a continuation-in-part of 2,582, Jan. 13, 1970.
This application Mar. 23, 1970, Ser. No. 21,905
Int. Cl. A01b *45/02, 59/06, 65/06*
U.S. Cl. 172—21 **9 Claims**



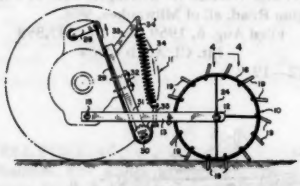
A draw bar and hitch connection for coupling a plurality of substantially identical implements to a tractor, and including means for permitting independent vertical movement of each implement relative to the ground as the tractor traverses the ground. The draw bar and hitch connection includes means for utilizing a power lift apparatus carried by the tractor to transfer a portion of the weight of the tractor to the implements and also includes means for disconnecting the plurality of implements from the tractor without disturbing the weight transfer means.

3,650,332

SOIL CORING APPARATUS ASSEMBLY

Arnold A. Dedoes, 2070 W. Eleven Mile Road, Berkley, Mich.

Filed Feb. 3, 1969, Ser. No. 795,853
Int. Cl. A01b *45/02*
U.S. Cl. 172—22 **5 Claims**



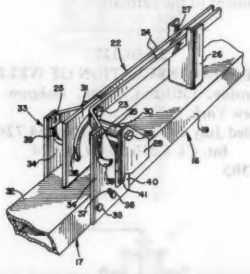
This invention relates to soil penetrating implements of the kind for removing soil plugs of earth for the purpose of aerating, watering and fertilizing the soil or for any other agricultural purpose of treating the subsurface, and the particular improvement resides in the manufacture assembly, repair and operation of the several parts of the implement in a more efficient manner. The features are accomplished by, clamping the flexible steel ground engaging rim with its coring elements around separate spaced apart parallel wheel supports which are loosely mounted on a shaft journaled in a frame which may be coupled to a tractor and raised or lowered by the tractor hydraulic mechanism.

3,650,333

HINGE MECHANISM FOR FOLDING DISK HARROW GANGS

Jerome L. Fueslein, Stockton, Calif., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 14, 1970, Ser. No. 71,775
Int. Cl. A01b *63/32, 65/02;* **E05d** *11/10*
U.S. Cl. 172—311 **12 Claims**



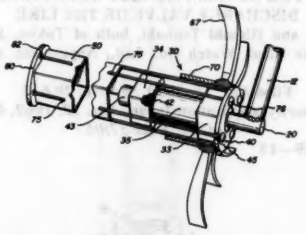
Mechanism for folding the extension wings of a disk harrow utilizing a hydraulic cylinder connected to each wing section, wherein the connection between the cylinder and each of the wings provides maximum leverage throughout the extension and retraction strokes of the cylinder to swing the wing section between its operating position and its folded inoperative position.

3,650,334

ROTARY CULTIVATOR ASSEMBLY

Roy W. Hagenstad, Crosslake, Minn.

Filed Jan. 2, 1970, Ser. No. 241
Int. Cl. A01b *21/04*
U.S. Cl. 172—540 **11 Claims**



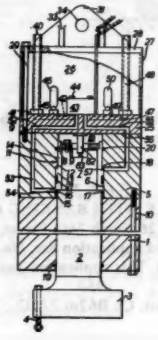
A rotary cultivator assembly comprising a support having an attachment extremity and a shaft extremity with a bearing assembly mounted on the shaft. The bearing assembly has a predetermined cross section and mounts tubular hubs in varying lengths in a cantilever manner to permit the mounting of a variable number of spider units or cultivator wheels on the same with the entire assembly being held in assembled relationship by means of an end cap and a flange on the bearing assembly and tie bolts extending therebetween.

3,650,335

APPARATUS FOR DRIVING AND/OR EXTRACTING PILES

Norman Lee, Coventry, and Francis Benjamin Levetus, Abingdon, both of England, assignors to Keelavite Hydraulics Limited, Allesley, Coventry, Warwickshire, England

Filed Oct. 8, 1969, Ser. No. 864,781
Claims priority, application Great Britain, Oct. 11, 1968, 48,337/68
Int. Cl. E02d 7/00
U.S. Cl. 173—91 6 Claims



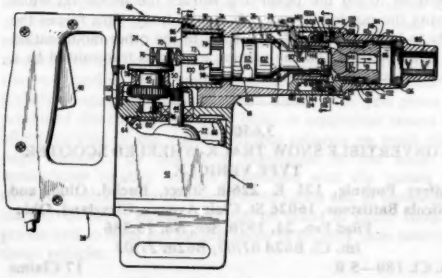
A method and apparatus for the vibratory driving of piles in which a hydraulic cylinder-and-ram assembly is arranged to impart a vibration of asymmetric waveform to the pile. The apparatus includes a closed-loop servo control system by which the movement of the ram relative to the cylinder is according to an input signal of the desired waveform.

3,650,336

POWER DRIVEN DEVICE

Heinrich P. Koehler, Camillus, N.Y., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 847,294, Aug. 4, 1969. This application May 5, 1970, Ser. No. 34,844
Int. Cl. B25d 11/00
U.S. Cl. 173—110 21 Claims



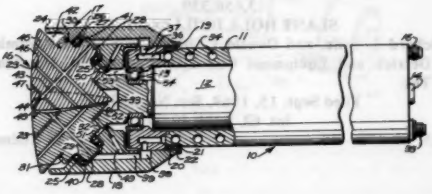
Power driven devices in which a closed type, cushioned tool holder is axially impacted by a free-floating driver mounted in a reciprocably driven, non-rotatable piston and also intermittently rotated and in which the mechanism producing intermittent rotation has two components which slip relative to each other when a rotation restraining force of a predetermined magnitude is exerted on the tool holder.

3,650,337

CRYOGENICALLY COOLED DRILL

Donald W. Andrews, Eldorado Hills; Eugene L. Kessler, and Roland A. Newton, both of Sacramento, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed July 31, 1969, Ser. No. 846,478
Int. Cl. E21b 3/10
U.S. Cl. 175—17 20 Claims



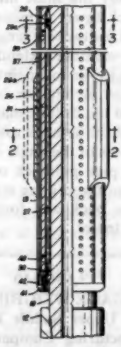
This discloses a drilling unit in which the drill bit mechanism is placed at the end of the rotor shaft of a motor either by direct attachment to the shaft or by gear. Cryogenic cooling is provided by sending cryogenic fluid into the rear portion of the motor and causing it to flow toward the front end of the motor for cooling the motor, effluent from the motor being conveyed into and through the drill bit and through bearings and gearing, for cooling and cleansing. The coolant effluent from the drill bit mechanism and motor passes into the bore hole thereby cooling it and carrying cuttings and debris upwardly through the hole.

3,650,338

ROTARY BIT GUIDE

Branch M. McNeely, Jr., 5313 Pine, Houston, Tex.

Filed May 25, 1970, Ser. No. 40,059
Int. Cl. E21b 7/06, 7/10
U.S. Cl. 175—76 10 Claims



A device for controlling the directional deviation of a well bore. An outer member is concentrically spaced around a mandrel which is connectable at opposite ends to form part of a drill string, the outer member having longitudinal ribs extending from its outer surface to frictionally engage the walls of the well bore and thereby restrict rotation of the outer member in the well bore. A first set of deformable pressure chambers which preferably comprise part of a rotary pump are located between the outer member and the mandrel. A second set of deformable pressure chambers, located between the outer member and the mandrel, commu-

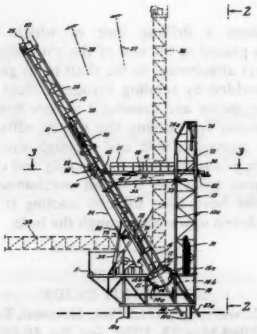
nicate via fluid passageways with the first set of pressure chambers. A fulcrum means is located between and in contact with said outer member and said mandrel whereby when fluid is transferred from the first set of chambers to the second set of chambers thereby causing the second set of chambers to apply a force against the mandrel in a lateral direction, the mandrel can pivot relative to the outer member.

3,650,339

SLANT HOLE DRILLING RIG

Richard J. Selfe, and Donald L. Bleyl, both of c/o Pyramid Derrick and Equipment Co., P.O. Box 40338, Houston, Tex.

Filed Sept. 15, 1969, Ser. No. 858,043
Int. Cl. E21b *19/00*
U.S. Cl. 175—85 **21 Claims**



A drilling mast is mounted on a support means which is pivotally mounted in an arcuate well formed in a drilling rig base structure whereby the mast may be tilted. A vertical self-supporting setback tower is mounted on the base structure adjacent the well for racking lengths of drill pipe. An adjustable strut or tie member extends between the drilling mast and the setback tower for maintaining the drilling mast at a desired angle of inclination. A catwalk structure is pivotally connected to the drilling mast and movably coupled to an upper portion of the setback tower so that it will always be horizontal, regardless of the angle of the drilling mast relative to the tower. A pipe pullback mechanism is supported for movement between the drilling mast and tower for use in transferring drill pipe back and forth between the drilling mast and the setback tower.

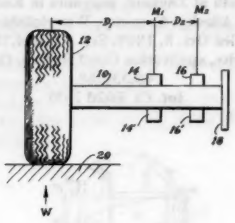
3,650,340

STRAIN GAGE WEIGHING DEVICE

Richard S. Bradley, Upper Saddle River, N.J., assignor to Art's-Way Manufacturing Company Incorporated, Armstrong, Iowa

Filed July 2, 1969, Ser. No. 838,438
Int. Cl. G01g *19/08*
U.S. Cl. 177—136 **13 Claims**

An electromechanical weight-measuring system for weighing successive and cumulative loads deposited in a load-receiving medium which utilizes one or more cantilevered, resilient or elastic deformable elements. Supporting the load-receiving medium are one, or preferably a plurality of crucial load points, wherein the cantilevered elements are interposed between the receiving medium and ground or other supporting base; pairs of strain gage sensing elements are mounted on and under each of the cantilevered elements. The sensing elements can be a variable resistance type connected together to form a bridge circuit, coupled to amplifying means and an indicating device for the measurement of the magnitude of bridge unbalance.

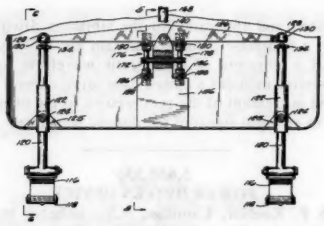


3,650,341

SNOWMOBILE WITH BANKING CONTROL

Hans P. Asmussen, 2126 North 26th Street, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 795,648, Jan. 31, 1969, now abandoned. This application Jan. 6, 1970, Ser. No. 953
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **6 Claims**



The skis are mounted on the lower ends of support columns or posts connected to a transverse beam pivoted on the centerline. In one modification the beam is a leaf spring and, when the steering column is turned, the control cages between the leaf spring and the ramps are moved in opposite directions to tilt the beam and retract the inside ski while moving the outside ski away from the body. This forces the body to bank or lean into the turn. In the other modification the beam is rigid and the turning motion is transmitted by a chain to jackscrews to tilt the beam.

3,650,342

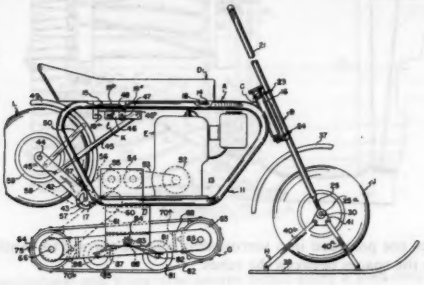
CONVERTIBLE SNOW TRACK-WHEELED SCOOTER TYPE VEHICLE

Godfrey Pushnig, 121 E. 226th Street, Euclid, Ohio, and Nicola Battistone, 16026 St. Clair Avenue, Cleveland, Ohio

Filed Feb. 24, 1970, Ser. No. 13,586
Int. Cl. B62d *61/02;* **B62m** *27/02*
U.S. Cl. 180—5 R **17 Claims**

A motor scooter type vehicle convertible between two-wheeled and ski and snow-belt-driven functional forms and further transportable in relatively compact form. A light weight vehicle frame weldment includes left and right hand tubular trapezoids having inwardly bent top front corners embracing a steering fork mounting head tube, spacer bars between seat-supporting, straight parallel major portions of horizontal upper reaches, and an engine and transmission gear box support plate between lower parallel horizontal reaches. With a snow tracking endless belt assembly and a

steering runner removably attached respectively to the frame bottom and to the axle of the front wheel in a steering fork detachably pivoted in the head tube, the belt chain driven from the engine through the gear box, a snow scooter type vehicle is available. A rear driving wheel, supported by a rearwardly extending fork pivoted at the rear bottom of the



frame and by paired shock absorber struts between respective rear fork arms and selected points on the frame upper reach region, has a permanent drive chain connection to the gear box, so that upon runner and snow belt assembly removal and rear wheel shift, from an upwardly retracted inoperable location downwardly into a driving position, a wheeled motor scooter vehicle arises.

3,650,343

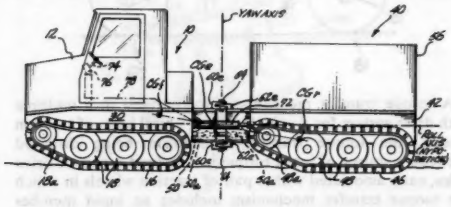
SKI SLOPE TRAVERSING AND CONDITIONING VEHICLE

John B. Helsell, 4601-91st Place, N. E., Bellevue, Wash.

Filed Mar. 12, 1970, Ser. No. 18,907

Int. Cl. B62d *11/20*; **B62m** *27/02*

U.S. Cl. 180—5 R **8 Claims**



An articulated multi-unit track-type vehicle is disclosed for traversal, packing and leveling of snow on a ski slope and similar applications. The interconnected, relatively wide and narrow units of the special-purpose vehicle are structurally constrained by their coupling against relative pitch and relative roll motion while being permitted relative yaw motion. Relative angular positioning of the units in the yaw plane is produced directly by hydraulic jacks or equivalent means to effect steering of the vehicle without reliance on track slippage therefor. By reason of constraint of the units to monoplanar relative motion combined with the means to steer, the vehicle can be maneuvered safely and in controlled manner on steep slopes, and can be made to climb steeper grades and to level out moguls more effectively than conventional vehicles.

3,650,344

RECREATIONAL VEHICLE

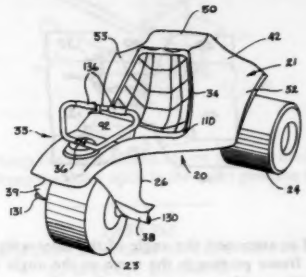
John A. Plessinger, 1725 Wesleyan Road, Dayton, Ohio, and Franklin Moore, Jr., 902 McBurney Drive, Lebanon, Ohio

Filed Apr. 6, 1970, Ser. No. 25,816

Int. Cl. B62k *5/06*

U.S. Cl. 180—27 **12 Claims**

The vehicle comprises a body with two rear driving wheels and a front steering wheel. The body comprises a forwardly narrow main frame with an intermediate bucket seat and an engine and axle supporting member extending rearwardly from around the seat for positioning the engine and drive wheels to the rear of the seat. A closed handle is attached to



the front wheel for hand steering and stirrups are mounted on each side of the front wheel for foot steering by the driver with his legs on the opposite sides of the narrow front of the main frame.

3,650,345

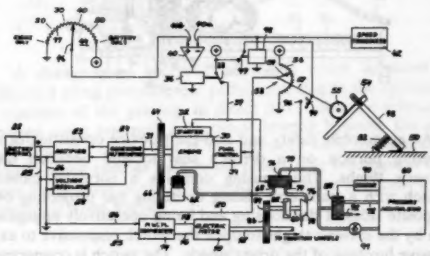
CONTROL SYSTEM FOR ALTERNATELY BATTERY-OPERATED AND ENGINE-POWERED VEHICLE

Michel N. Yardney, 366 Central Park West, New York, N.Y.

Continuation-in-part of application Ser. No. 710,347, Mar. 4, 1968, now Patent No. 3,503,464. This application Dec. 9, 1969, Ser. No. 883,462

Int. Cl. B60l *11/12*; **B80l** *11/14*

U.S. Cl. 180—65 A **16 Claims**



Automotive vehicle of the hybrid-powered type wherein the traction wheels are driven at low speeds by electric energy stored in a battery and at high speeds by an internal-combustion engine simultaneously recharging the battery. The engine, when running, may also load a mechanical force storer, such as an air pressure accumulator, used to assist in the starting of the vehicle to conserve battery power; in the absence of such a stored force, the engine is used for starting and then ceases to operate until a certain minimum speed is reached.

3,650,346

STEERING CONTROL

Joseph C. B. Desmarais, RFD #2 Bible Hill, and Richard W. Beaumont, 3 Clifton Avenue, both of Claremont, N.H.

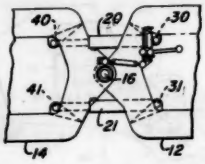
Filed Mar. 12, 1969, Ser. No. 806,460

Int. Cl. B62d *5/08*

U.S. Cl. 180—79.2 B **5 Claims**

A steering control for center pivot or frame steering vehicles wherein the vehicles are steered by hydraulic cylinders interposed between relatively pivotable front and rear por-

tions of the vehicle frame. Fluid flow to these cylinders is controlled for extension and retraction by a steering valve having a handle or tiller mounted in mechanical connection with the pivotable frame portions so that steering is accomplished by pushing the tiller in the direction toward which it



is desired to steer and the angle of the tiller with respect to the front frame portion is the same as the angle of the rear frame portion with respect to the front frame portion and consequently the tiller position constantly indicates the steering attitude of the two frame portions.

3,650,347

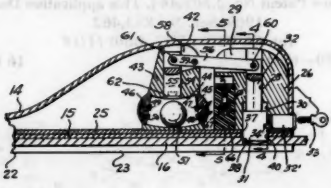
AUTOMOBILE SAFETY AND ANTI-THEFT DEVICE

Adolph J. Campos, 905 McCarter Highway, Newark, N.J.

Filed Oct. 3, 1969, Ser. No. 863,449

Int. Cl. B60r *25/10*

U.S. Cl. 180—114 **4 Claims**



An automobile safety and anti-theft device consisting of a housing portion on a driver's seat located between the driver's thighs. The housing contains a normally closed switch with a transverse sliding operating bar projecting on opposite sides of the housing and being operatively engageable by the driver's thighs to open the switch responsive to excessive lurching of the driver's body. The switch is connected in the ignition circuit of the automobile. The housing also contains a tilt-responsive alarm switch connected in an alarm circuit to energize an alarm when the automobile is tilted for towing by an unauthorized person. Also contained in the housing is a key-operated seat lock to lock the driver's seat in a position too close to the steering wheel for a person to occupy the seat. Releasing the seat lock also de-activates the alarm switch.

3,650,348

SUPERSONIC NOISE SUPPRESSOR

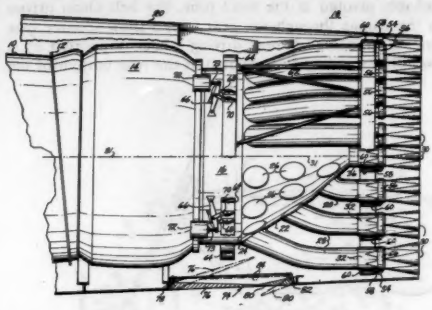
Ross W. Colebrook, Seattle, Wash., and Peter H. Ellis, Chula Vista, Calif., assignors to The Boeing Company, Seattle, Wash. and Rohr Corporation, Chula Vista, Calif.

Filed Feb. 19, 1970, Ser. No. 12,660

Int. Cl. B64d *33/06*; F01n *1/14, 1/16*

U.S. Cl. 181—33 HC **7 Claims**

A jet exhaust nozzle having articulated variable geometry segments attached to the downstream end of an exhaust duct and an actuator to articulate the segments between a corrugated subsonic noise suppression configuration and a divergent expansion surface supersonic cruise configuration. When applied to a multi-tube exhaust nozzle, closeable apertures are provided in a surrounding nacelle shroud to ventilate the spaces between the tubes.



3,650,349

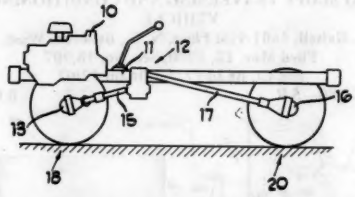
FOUR WHEEL DRIVE VEHICLE INCORPORATING LIMITED STRIP INTERAXLE DIFFERENTIAL

Richard E. Cleveland, Garrett; Jack M. Fisher, Muncie; Jack G. Glaze, Auburn, and William G. Jeakle, Muncie, all of Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 1, 1970, Ser. No. 42,172

Int. Cl. B60k *17/34*

U.S. Cl. 180—44 **6 Claims**



A torque transfer mechanism incorporated in a multiple path drive system for a vehicle having plural pairs of traction wheels, the torque transfer mechanism being disposed between a source of input torque and at least a pair of drive axles, each associated with a pair of traction wheels in which the torque transfer mechanism includes an input member having a central axis, a casing member driven by the input member, a bevel gear system driven by the input member and a pair of output shafts coaxial with the input member, extending from an opposite side of the casing said output shafts being coaxial and telescoped one within the other.

ERRATUM

For Class 181—33 see:
Patent No. 3,650,348

3,650,350

SHELF HANDLING DEVICE

Willy Frick, Wallisellen, Switzerland, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Filed July 7, 1970, Ser. No. 52,795

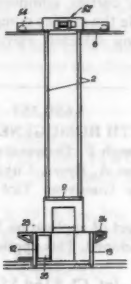
Claims priority, application Switzerland, July 16, 1969, 10849

Int. Cl. E04g *1/18*; B66b *9/20*

U.S. Cl. 182—14 **7 Claims**

A shelf handling device includes vertically extending masts with either top or bottom guide wheels which are adapted to move along trackways between shelves and which includes a

lower base with a basket stand providing a reinforcement for the mast and which includes four columns interconnected by

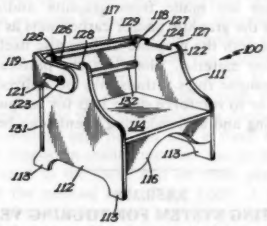


longitudinal and transverse beams which carry a load receiving means such as a lift truck or extendible load receiving table.

3,650,351
STEP CHAIR

Robert O. Schmidt, St. Paul, Minn., assignor to Richard O. Bartz, Minneapolis, Minn.

Continuation-in-part of application Ser. No. 808,926, Mar. 20, 1969, now Patent No. 3,530,954. This application June 3, 1970, Ser. No. 43,087
Int. Cl. A47c *13/00*
U.S. Cl. 182—33.3 **15 Claims**



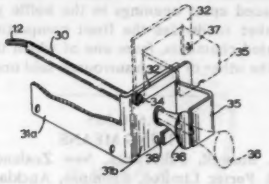
A step chair having a fixed seat secured to upright side members. A movable panel is slidably mounted on the side members adjacent the seat for movement to a top step position. The panel can be elevated in response to movement of a back rest. When the back rest is in a down step position, the movable panel is held in an up step position. An elevating mechanism, operable in response to pivotal movement of the back rest, selectively moves and holds the movable panel to an up step position and to a down seat position.

3,650,352
REMOTELY OPERATED OIL DRAIN VALVE FOR MOTOR VEHICLES

Richard L. Schwary, 2105 N. W. Couch Street, Camas, Wash.

Filed Nov. 14, 1969, Ser. No. 876,753
Int. Cl. F01m *11/04*
U.S. Cl. 184—1.5 **1 Claim**

A remotely operated oil drain valve for internal combustion engine crankcases having a valve attached to the bottom of the crankcase, a cable for operating the valve extending to a location remote from the valve and at an easily accessible location for manual operation thereof, and a member for receiving and holding the remote end of the cable in the easily accessible location, which said member

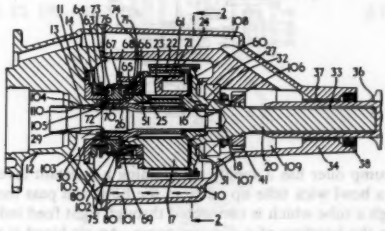


operates to keep the valve closed in one position thereof and operates to keep the valve open in the other position thereof.

3,650,353
LUBRICATION SYSTEM FOR CHANGE-SPEED EPICYCLIC GEARING

Randle Leslie Abbott, 96 Radford Road, Leamington Spa, England

Filed Feb. 2, 1970, Ser. No. 7,839
Claims priority, application Great Britain, Feb. 19, 1969, 8,880/69
Int. Cl. F16n *7/20*
U.S. Cl. 184—6.12 **3 Claims**

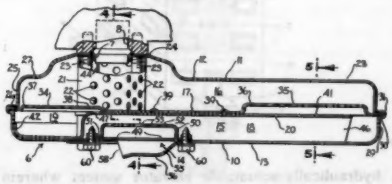


A change-speed epicyclic gearing in which lubricant is directed along two different paths according to the operative condition of the gearing. In direct drive ratio the lubricant passes along one path to a thrust bearing between the sun gear and the casing and in the epicyclic ratio the lubricant passes along another path to the planet gear bearings. In this way those parts of the gearing which require lubricant only receive it when needed.

3,650,354
MUFFLER FOR INTERNAL COMBUSTION ENGINES

Douglas Gordon, Hartford, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Apr. 12, 1971, Ser. No. 133,101
Int. Cl. F01n *1/08, 7/10, 7/20*
U.S. Cl. 181—40 **9 Claims**



A muffler for a single cylinder engine comprises a shallow, elongated shell having a rear wall with an inlet port near one

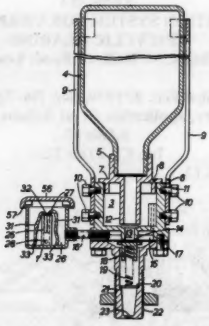
end of the shell and a front wall with an outlet port. A baffle plate clamped between the shell members divides the shell interior into front and rear compartments, communicated through spaced apart openings in the baffle plate. A front baffle member subdivides the front compartment into two communicated chambers, from one of which the outlet port opens and the other of which surrounds said one.

3,650,355

OILING MEANS

Gordon H. Boswell, Pakuranga, New Zealand, assignor to Mason & Porter Limited, Panmure, Auckland, New Zealand

Filed July 9, 1970, Ser. No. 53,379
Int. Cl. F16n *17/06*
U.S. Cl. 184—59 6 Claims



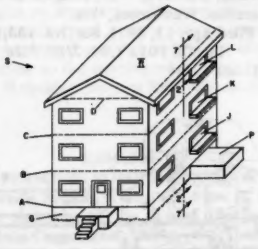
A pump oiler has a supply maintaining a constant level of oil in a bowl wick take up oil from the bowl and pass the oil through a tube which is connected through sight feed indicators to the bearings of a vacuum pump. An air bleed is provided in the connections and by adjustment of the air bleed a suitable rate of air is caused to flow through the bearings from the bowl and this flow of air entrains oil from the bowl for lubrication of the pump.

3,650,356

HYDRAULICALLY-ACTUATABLE ELEVATOR SYSTEM

Rchard L. Brown, 1812 Pelton Avenue, Bellevue, Nebr.

Filed Dec. 18, 1969, Ser. No. 886,101
Int. Cl. B66b *11/04*
U.S. Cl. 187—17 7 Claims



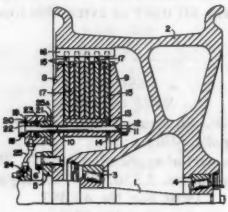
A hydraulically-actuatable elevator system wherein the vertically reciprocatable cargo-carrying carrier component is suspended from a lofty superstructure by at least one hydraulically-actuatable elongate piston of the generic casing-plunger type. Forceable introduction of hydraulic fluid into the piston will decrease the piston overall elongate length causing the carrier component to ascend toward the overlying superstructure while controlled withdrawal of hydraulic fluid from the piston will increase the piston overall length allowing the weighty carrier component to descend. Novel control means enable the carrier component to be temporarily stationable at any selected elevation within the piston length range.

3,650,357

DISC BRAKE WITH HOMOGENEOUS BRAKE STACK

John P. Nelson; Joseph F. Dernovshek; Hal E. Miller, all of Akron, and Clifton A. Byers, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of application Ser. No. 739,836, June 25, 1968, now abandoned. This application May 8, 1969, Ser. No. 833,836
Int. Cl. F16d *55/36*
U.S. Cl. 188—71.5 20 Claims



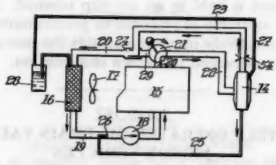
A lightweight disc brake utilizing homogeneous brake discs to provide heat absorbing characteristics superior to steel. The brake discs are made from graphite and/or carbon materials where the graphite and/or carbon acts as the primary heat sink and with the graphite-carbon disc itself acting as the basic friction material. The discs are preferably in the shape of flat annular rings. Straps may be utilized in a segmented design or to reinforce drive lugs for torque transmittal. Strengthening and anti-oxidizing agents can be added to the discs.

3,650,358

DECELERATING SYSTEM FOR TOURING VEHICLES

Pierre Etienne Bessiere, Golf-De-Saint-Nom-La-Breteche, France, assignor to Labavia-S.G.E., Paris, France

Filed Sept. 16, 1969, Ser. No. 858,321
Claims priority, application France, Sept. 17, 1968, 166527
Int. Cl. F16d *57/02*
U.S. Cl. 188—296 19 Claims



This system is intended for touring vehicles driven at a high speed corresponding to an engine shaft speed above 3,000 r.p.m. and preferably above 5,000 r.p.m. The engine is cooled by forced water circulation in a circuit comprising in series a pump, the engine and a radiator having a high heat dissipation capacity. The system comprises a hydraulic decelerator whose rotor runs permanently at a speed of at

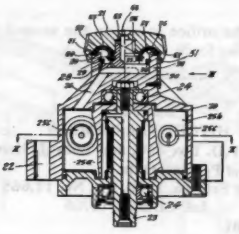
least the same order as engine shaft speed and whose diameter is less than 20 centimeters. The decelerator is connected in parallel to a part of the engine cooling circuit by means of a three-way two-position valve which when in one position sends all the water it receives to said part of the circuit isolating the decelerator, while when in its other position the valve sends all the water it receives to the decelerator inlet, isolating said circuit part.

3,650,359

OSCILLATING PISTON-TYPE DASHPOTS

Alan Richard Brine Nash, 39 Abbot's Ride, Farnham, England

Filed Feb. 3, 1970, Ser. No. 8,165
Claims priority, application Great Britain, Mar. 17, 1969, 13,962/69
Int. Cl. F16d *57/02*
U.S. Cl. 188—310 **8 Claims**



The specification describes a dashpot having a vane member pivotably mounted in a fluid-filled body to be rotatable through an angle of less than 360°. Movement of the vane member displaces the dashpot fluid through a valve that has an adjustable throttling effect and the damping rate of the dashpot is controlled thereby. The valve is mounted in a recess of a necked end of the dashpot body concentric with the pivot axis of the vane member and a control knob having a lip that overlaps said necked end is fixed to the valve to rotate it. A ring-form sealing member has an inner peripheral region secured to the valve and an outer peripheral region secured to the necked end of the body. A supplementary sealing member is compressed between said outer peripheral region and the control knob lip to provide a further seal at this position. A resilient clamping band at the inner peripheral region assists the seal there. Calibration means are also provided between the control knob lip and said necked end of the body to facilitate adjustment of the valve and these calibration means are further employed to set limits to the rotational adjustment of the valve.

3,650,360

TRUCK BRAKE

Robert L. King, and Eloyce M. King, both of 610 Shore Pines Lake, Coos Bay, Gold Beach, Oreg.

Filed Dec. 30, 1969, Ser. No. 889,270
Int. Cl. F16d *51/22, 69/00*
U.S. Cl. 188—330 **12 Claims**

A wheel brake system for a truck or the like including a brake shoe having the usual semicylindrical band with a brake lining secured over its outer convex surface, but being provided with generally radially inwardly projecting apertured mounting lugs spaced along its arcuate extent. Each shoe further includes a pair of registered inner and outer arcuate plates over whose outer edge surfaces the concave inner surface of the band is disposed with the lugs carried by the band sandwiched and clamped between the plates by through bolts secured therethrough. The inner side plate, independent of the through bolts, is removably mounted in position whereby after the through bolts have been removed the inside plate may be axially withdrawn from the associated

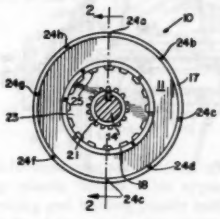
drum and the lining may thereafter also be axially withdrawn from the drum.

3,650,361

QUIET OPERATING ELECTROMAGNETIC CLUTCH OR BRAKE

Eric R. Fossum, Simsbury, Conn., assignor to General Time Corporation

Filed May 28, 1970, Ser. No. 41,521
Int. Cl. F16d *27/10;* **F16f** *15/12*
U.S. Cl. 192—30 V **6 Claims**



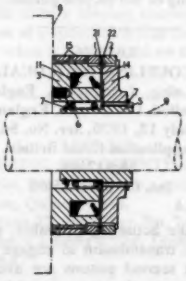
This invention is directed to an electromagnetic drive mechanism comprising an armature, a rotor having a flange extending from the outer periphery thereof, and a shaft wherein the flange has randomly spaced slots therein and resilient drive means connect the rotor and shaft.

3,650,362

TORQUE LIMITING DEVICES

John Bruce Davidson, Angus, Scotland, assignor to Coventry Gauge & Tool Company Limited, Coventry, England

Filed July 13, 1970, Ser. No. 54,131
Int. Cl. F16d *43/20*
U.S. Cl. 192—56 R **2 Claims**



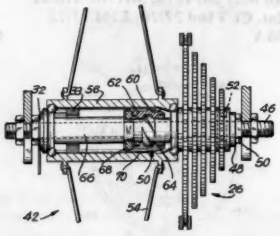
A torque limiting device is provided in which a pair of opposed driving and driven toothed members or rings are nor-

mally held in meshing engagement by magnetic or electromagnetic means and an armature to the latter, generally V-form teeth of the rings riding out of engagement on excess torque which causes movement of the rings apart and in turn creates an air gap between the magnet and armature whereby the magnetic field is greatly weakened to prevent re-engagement of the toothed rings until resetting action is taken by closing a switch in parallel with a resistor so as to increase current flow to the coil of the electromagnetic means for obtaining re-engagement of the toothed members or rings which engagement is maintained by reduced current flow via the resistor when the switch is opened for normal operation of the device. The resistor may be variable for obtaining variation in the torque limiting action.

3,650,363
BICYCLE CLUTCH AND PARTS ASSOCIATED THEREWITH

Martin Cristie, Brooklyn, N.Y., assignor to Stelber Industries Inc., Brooklyn, N.Y.

Filed Mar. 24, 1970, Ser. No. 23,082
Int. Cl. F16d *23/00*
U.S. Cl. 192—64 **4 Claims**



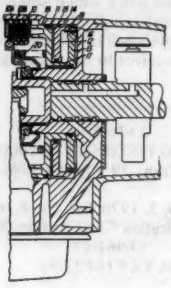
A bicycle in which a drive wheel is driven through a pedal-operated drive. A clutch is provided for transmitting the drive to the bicycle drive wheel, and this clutch is constructed so that it will respond only to operation of the drive in the direction which will propel the bicycle forwardly for assuming an engaged position to transmit motion to the drive wheel. Under any other conditions such as when the drive is operated in a reverse direction or when the drive is stationary the drive wheel is free to turn either in a forward or in reverse direction so that, for example, it is possible to freely roll the bicycle rearwardly when the drive is not operating or is operated in a reverse direction. This reverse direction can occur when the pedals are turned rearwardly, and a brake structure brakes the movement of the bicycle in response to such rearward turning of the bicycle pedals.

3,650,364
FRICTION COUPLING WITH DUAL PISTONS

James Morrison Laing, Letchworth, England, assignor to Borg-Warner Limited, Letchworth, England

Filed July 15, 1970, Ser. No. 54,968
Claims priority, application Great Britain, July 18, 1969, 36,417/69
Int. Cl. F16d *25/06*
U.S. Cl. 192—85 AA **5 Claims**

A clutch or brake actuating assembly, e.g., for use in a vehicle automobile transmission to engage a friction device in which first and second pistons are axially slidable in a cylinder. A reaction member is mounted by axially sliding it into place between the two pistons and is provided with a small orifice. Hydraulic fluid enters through a port between the first piston and the member, to move the first piston and begin engagement of the friction device, and subsequently

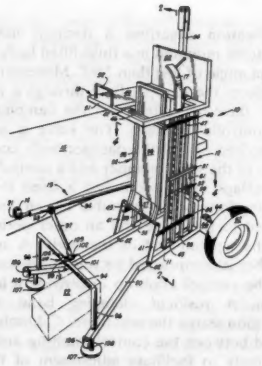


bleeds through the orifice to act on the second piston to increase the engaging force.

3,650,365
HITCHING ASSEMBLY

Jack K. Vassar, P.O. Box 460, and Boby J. Henigman, P.O. Box 452, both of Perkins, Okla.

Filed Feb. 16, 1970, Ser. No. 11,669
Int. Cl. B65g *65/06*
U.S. Cl. 198—7 BL **6 Claims**



The present invention relates to apparatus for hitching a movable frame to a vehicle and is primarily useful in combination with a bale loader. When used with a bale loader, the present invention may comprise a tension member which bears the primary pulling tension and which is secured at one of its ends to a towing vehicle, such as the side of a truck, while the other of its ends is pivotally secured to the rear portion of the bale loader. At the point of contact between the tension member and the vehicle there is provided a universal type coupling to allow limited, relatively free motion between the tension member and the towing vehicle. Near the front of the frame which carries the bale loader there is provided an elongated guide means which in a preferred embodiment is shaped in the form of an inverted "U" with the downwardly pointing arms of the "U" being rigidly secured to opposite sides of the bale loader frame. Connecting means are provided between the upper portion of the guide means and a point on the tension member immediately behind the point at which the tension member is secured to a vehicle. The point

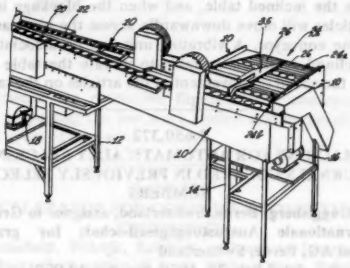
of connection between the connecting means and guide means may be varied and for this purpose there may be provided a sleeve which is slidably mounted upon the guide means and which carries an outwardly projecting connecting stub which fits into an aperture formed in the connecting means. Means, such as a threaded bolt, is provided in combination with the sleeve to allow the sleeve to be securely locked into place at a given point upon the guide means and thereafter, upon loosening the bolt, moved to another point thereon without removing the sleeve therefrom.

3,650,366

EGG HANDLING CONVEYOR EQUIPMENT

Roy Bruce Wyland, Arcadia, Calif., assignor to J. W. Wyland & Sons, Inc., San Gabriel, Calif.

Filed June 26, 1969, Ser. No. 836,703
Int. Cl. B65g *47/26*
U.S. Cl. 198—30 **4 Claims**



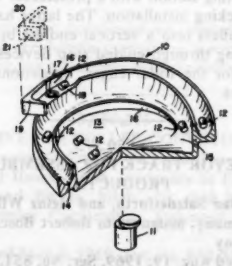
An improved egg handling machine is provided on which eggs are loaded and are conveyed in successive rows of, for example, six eggs abreast, and in which each row is subsequently separated into two longitudinally spaced rows of three eggs abreast each, for example, with the eggs from the two longitudinally spaced rows being fed to corresponding tandem conveyors so that the eggs may be conveyed to other egg handling machinery in each of the tandem conveyors in single file and with a longitudinal orientation.

3,650,367

VIBRATORY BOWL FEEDER

Dennis E. Mead, Cazenovia, N.Y., assignor to Lipe-Rollway Corporation, Liverpool, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,347
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **11 Claims**



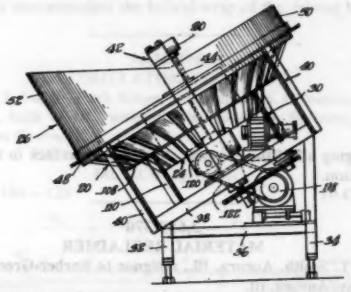
A vibratory bowl feeder for cylindrical objects is improved by having an upwardly inclined trough that is uninterrupted and has a generally uniform cross section approximately in the shape of a conic section, preferably that of a parabola or hyperbola. Cylinders that are at least nearly as long as their diameters are accurately jiggled into end-to-end alignment in such trough without any jamming, mis-alignment, or rejection, and a single size trough can accommodate many sizes of cylinders.

3,650,368

ARTICLE-ORIENTING APPARATUS

John C. Nalbach, Village of La Grange Park, Ill., assignor to John R. Nalbach Engineering Co., Inc., Chicago, Ill.

Filed Nov. 30, 1970, Ser. No. 93,623
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **21 Claims**



An apparatus for orienting and feeding lightweight articles, such as, empty plastic bottles. The apparatus includes a hopper for receiving and holding plastic bottles. The floor of the hopper is defined by a stationary cover which is spaced from the hopper's side wall to allow a bottle to be positioned between the side wall and the cover. A rotary drum having its axis of rotation offset from the vertical is positioned below the cover and extends beyond the periphery of the cover to the side wall of the hopper. The rotary drum has a plurality of chutes fixed thereon. Each chute has a portion movably positioned between the edge of the cover and the hopper side wall for receiving bottles. Since the axis of rotation of the drum is offset from the vertical, the chutes carry bottles from a lower portion of the hopper to an upper point, where each bottle falls down its respective chute onto a shelf. The chutes move the respective bottles along the shelf until the bottles come to the end of the shelf and the bottles drop to a second shelf. The chutes move the bottles along the second shelf until the bottles come to the end of the second shelf, when the bottles transfer onto a moving conveyor. The conveyor and the drum move at a speed such that the speed of the bottle is not changed when it is deposited on the conveyor.

3,650,369

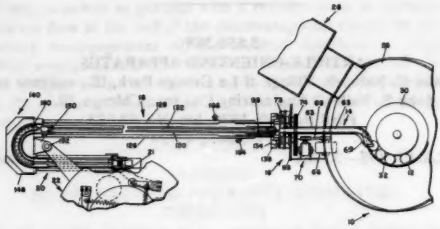
CLOSURE FEEDING AND ORIENTING APPARATUS

Robert W. Vergobbi, Braintree, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed June 27, 1968, Ser. No. 740,517
Int. Cl. B65g *47/24, 53/00*
U.S. Cl. 198—33 AA **9 Claims**

Comprises a feeding device for initially aligning randomly arranged closures edge to edge in a row facing in either one

direction or the other, and an orienting device for thereafter



arranging all of the closures thus aligned to face in the same direction.

3,650,370

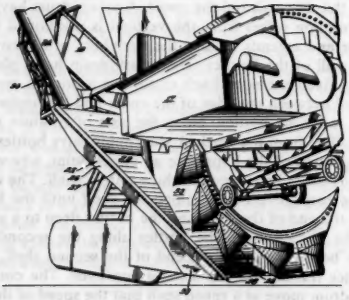
MATERIAL RECLAIMER

Fred T. Smith, Aurora, Ill., assignor to Barber-Greene Company, Aurora, Ill.

Original application Apr. 3, 1968, Ser. No. 718,466, now Patent No. 3,595,371. Divided and this application Jan. 19, 1971, Ser. No. 107,652

Int. Cl. B65g *65/28*

U.S. Cl. 198—36 10 Claims



A self-propelled reclaimer for moving material from a stockpile. The reclaimer has a sloper for removing material from the face of the pile and a bucket wheel for removing material from in front and to the side of the reclaimer and a common conveyor receiving both streams of material. The sloper is carried by a tiltable boom which carries means for directing material which avoids the conveyor to a second means carried by the reclaimer which directs the material to the bucket wheel. The sloper is angled so that the top thereof leads the conveyor. The conveyor extends to the face of the stockpile and has a projecting edge associated therewith to seal into the stockpile. The second means also contours the slope of the stockpile below the sloper.

3,650,371

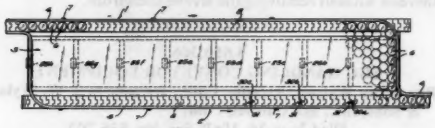
ACCUMULATOR TABLE FOR A CONVEYING SYSTEM

Charles F. Constable, South Milwaukee, and Robert F. Risley, Wauwatosa, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Nov. 5, 1969, Ser. No. 874,325

Int. Cl. B65g *47/00*

U.S. Cl. 198—45 16 Claims



A conveying system, including a conveyor and an accumulator table located adjacent the conveyor and sloped downwardly toward the conveyor. When a blockage occurs in the conveyor system, the articles being conveyed accumulate on the inclined table, and when the blockage is cured, the articles will move downwardly across the plate and back onto the conveyor. A vibrating unit can be associated with the inclined accumulator table to vibrate the table and increase the speed of movement of the articles on the table.

3,650,372

MACHINE FOR AUTOMATICALLY STACKING JOURNALS COUNTED IN PREVIOUSLY SELECTED NUMBERS

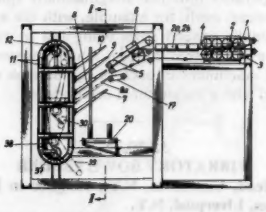
Ernst Guggisberg, Berne, Switzerland, assignor to Graphicart Internationale Ausrustungsgesell-schaft fur graphische Kunst AG, Berne, Switzerland

Filed Feb. 20, 1970, Ser. No. 12,992

Claims priority, application Switzerland, Feb. 28, 1969, 3145/69

Int. Cl. B65g *37/00*

U.S. Cl. 198—75 2 Claims



The machine has a first horizontal conveyor belt for all the copies pressed at the fold to the same thickness, which transfers the copies to a second downly moving conveyor belt, passing a counting station with a preselector which transmits pulses to a stacking installation. The latter has stack-bearing arms led by rollers into a vertical endless belt having guide rails and passing through guided stop devices. Arrest means are provided for the roller cages, operationally coupled to the stop devices.

3,650,373

CONVEYOR TRACK FOR ASSEMBLY LINE PRODUCTION

Georg Kern, Bad Salzdetfurth, and Heinz Wilke, Hildesheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

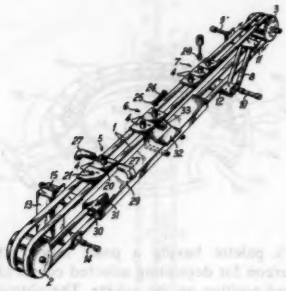
Filed Aug. 19, 1969, Ser. No. 851,277

Int. Cl. B65g *37/00*

U.S. Cl. 198—85 8 Claims

The invention relates to a conveyor system having spaced, parallel horizontally extending continuously traveling endless

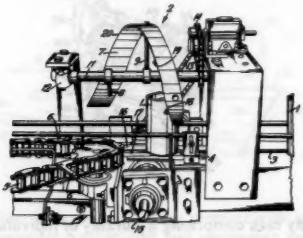
belts having upper and lower flights arranged to feed workpieces to work stations spaced along the conveyor. The system also includes transfer devices for shifting work carriers between the respective flights of the conveyor subsequent to passing the last work station and preparatory for the next cycle of operation.



3,650,374
ACCELERATOR FOR CONTAINER CONVEYING EQUIPMENT

Tom Mansfield, Wilrijk, Belgium, assignor to International Machinery Corporation, S.A., St. Niklaas-Waas, Belgium

Filed Apr. 29, 1970, Ser. No. 33,020
Claims priority, application Belgium, May 9, 1969, 49090
Int. Cl. B65g *47/31*
U.S. Cl. 198—104 **5 Claims**



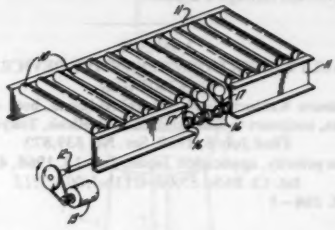
An accelerator for containers on container conveying equipment, said accelerator comprising a rotating container engaging cam having a generally helical profile.

3,650,375
DRIVE FOR ROLLER CONVEYORS

Fred J. Fleischauer, Oakmont, Pa., and Theodore A. Hammond, Grand Haven, Mich., assignors to Ermanco Incorporated, Grand Haven, Mich., by said Hammond and General Logistics Corporation, Oakmont, Pa., by said Fleischauer

Filed May 5, 1969, Ser. No. 842,043
Int. Cl. B65g *13/02*
This application filed under Rule 47
U.S. Cl. 198—127 R **6 Claims**

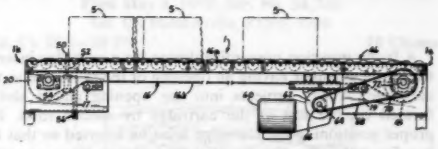
A drive for a live-roller conveyor system is described in which individual rollers are driven from a powered cross-shaft through an elastomeric belt having a circular cross-section. A spool-shaped sliding pulley is provided for one shaft which floats axially to seek its optimum driving position, with the spool preferably being in the shape of a hyperboloid of revolution, broken at its center striction line with the end sections spaced apart by a cylindrical portion of a length sufficient to accommodate the helical wrap of the driving band.



3,650,376
ACCUMULATING CONVEYOR

William J. Burgis, Park Ridge, and Marvin H. Coleman, Winnetka, both of Ill., assignors to Conveyor Systems, Inc., Morton Grove, Ill.

Filed Aug. 17, 1970, Ser. No. 64,202
Int. Cl. B65g *15/30*
U.S. Cl. 198—129 **10 Claims**

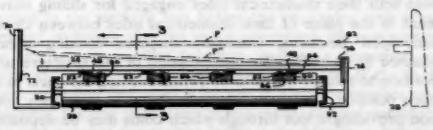


An accumulating conveyor having laterally spaced roller means for supporting articles for movement along a conveying path and means for stopping articles on the conveyor where desired. The articles are most advantageously impelled along the laterally spaced roller means by one or more longitudinally spaced projecting portions preferably on a continuous belt whose upper section moves in the space between the laterally spaced roller means. EAch projecting portion of the belt rises slightly above a plane tangent to the top of the roller means and has an upwardly and rearwardly inclining leading edge portion which provides a shoulder which pushes the rear of an article along the laterally spaced roller means and readily slips beneath the article when the article is held against further movement along the laterally spaced roller means.

3,650,377
DRYER CONVEYOR MEANS

James T. Rash, Las Vegas, Nev., assignor to Mouldings, Inc., Marion, Va.

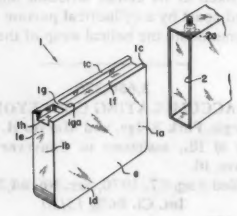
Filed Nov. 19, 1970, Ser. No. 91,099
Int. Cl. B65g *15/12*
U.S. Cl. 198—190 **3 Claims**



A belt type conveyor is provided in which the upper flights of plural conveyor belts ride in an elongated slot canted with respect to the axis of the belt so that line contact is provided

for supported articles on the flights by a corner edge of each belt with strip elements being projected above the conveyor to engage a first abutment and rebound against a second abutment for positioning the strip elements on the conveyor for movement through a dryer.

3,650,378
FAULTY INSERTION PREVENTIVE DEVICE FOR CARTRIDGES
Tokusaburo Kakiuchi, and Hideaki Akiyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed July 8, 1969, Ser. No. 839,873
Claims priority, application Japan, July 13, 1968, 43/59916
Int. Cl. B65d *85/00*; **G11b** *1/00, 23/12*
U.S. Cl. 206—1 **5 Claims**

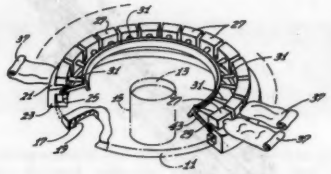


A faulty insertion preventive device for a cartridge insertable into a chamber having an opening of the same size as the cartridge. A key projects into the opening and a slot is formed on the top of the cartridge by spaced rows. For proper positioning the cartridge must be inserted so that the key fits within the slot for abutment against transverse stop adjacent the end of the rows.

3,650,379
TOY BANK
Marshall J. La Montagne, 106 Connolly Road, Avon, Mass.
Filed Jan. 2, 1970, Ser. No. 367
Int. Cl. A45c *13/10*
U.S. Cl. 206—1.5 **13 Claims**

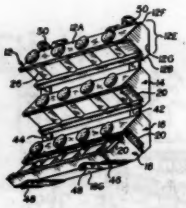
A spherical structure embodying two hollow hemispherical shells which collectively provide a chamber, said shells being held with their diametrical sides engaged for sliding movement in the plane of their diametrical sides between closed and open positions, internally disposed locking means adapted to be shifted by manipulation of the structure to a position to release the parts to permit moving the parts to an open position, said parts when displaced to said open position providing a slot through which coins may be deposited into the chamber, and a normally closed closure adapted to be opened when the parts occupy a predetermined position to enable removing the content of the chamber therefrom.

3,650,380
ARTIST'S PALETTE
Richard C. Hutchison, 10418 Inglewood Avenue, Inglewood, Calif.
Filed Jan. 19, 1970, Ser. No. 3,751
Int. Cl. B44d *3/02*
U.S. Cl. 206—1.8 **6 Claims**



An artist's palette having a paint tube rack movably mounted thereon for depositing selected colors of paint in a predetermined position on the palette. The plurality of paint tubes are threadably attached to the rack so as to be individually connected to extension members which are tiltably mounted on the rack. The extension members are normally held against a sealer which is fixedly mounted on the rack. When paint is to be dispensed from the tube, the applicable extension member may be tilted about a pivot point so that the end of the extension is placed in close proximity with the palette; the tube is then squeezed for extrusion of paint.

3,650,381
DISPLAY RACK
Frederik Weindling, 205 Southfield Avenue, Stamford, Conn.
Filed June 2, 1970, Ser. No. 42,663
Int. Cl. B65d *25/00*; **A47b** *73/00*
U.S. Cl. 206—45.11 **14 Claims**



A display rack comprising a plurality of individual sections, each having a plurality of spaced openings which receive containers therein. Connecting means connects the sections together for movement between an open position wherein the sections are spaced from each other to permit access to the containers, and a closed position wherein one section covers the containers in an adjacent section to prevent their removal. Fastening means is provided to maintain the rack in the closed position.

3,650,382
MOLDED PLASTIC DISPLAY PACKAGE
Samuel Braun, Rye; Robert Witkoff, Glen Cove, and George Northrop, Wantagh, all of N.Y., assignors to Cellu-Craft Inc., Lake Success, N.Y.
Filed Aug. 12, 1970, Ser. No. 63,188
Int. Cl. B65d *25/10, 11/00*
U.S. Cl. 206—45.14 **17 Claims**

An improved molded plastic display package is comprised of a first elongated member having an I-beam type cross section and a second U-shaped member that is slidable onto and

off of the first member and which includes releasable latch means for engagement with a portion of the first member. Terminal means are provided for mounting and displaying an

article of jewelry, for example, with the aid of an elastic extension. The present invention is very low in cost and requires a relatively shallow mold.

3,650,383

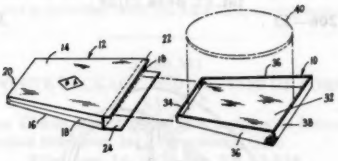
PIZZA CONTAINER

Michael A. Nigro, 420 Church St., Wethersfield, Conn.

Filed May 8, 1970, Ser. No. 35,742

Int. Cl. B65d *25/00*

U.S. Cl. 206—45.31 **7 Claims**



A container assembly has a tray member with a generally planar trapezoidal bottom wall and upstanding sidewalls. A bag member is cooperatively dimensioned and configured to accommodate snugly the tray member. In its preferred form, the bag member is provided with an upstanding front flap to facilitate stacking of a plurality of the containers and a window to allow observation of the contents of the package.

3,650,384

BULK DISPLAY SELF SERVICE BIN UNIT

Frank Raymond Pegg, 4. Holbrook Lane, Coventry, Warwickshire, England

Filed July 25, 1969, Ser. No. 844,899

Int. Cl. B65d *25/00*

U.S. Cl. 206—45.34 **1 Claim**

A bin unit for the eye catching and protective bulk display of commodities for sale and consisting of a substantially semi-spherical plastic receptacle having a transparent dome of complementary substantially semi-spherical shape openable from the receptacle and when closed onto the latter together providing a container of generally spherical form, the dome having openings spaced around its side for manual access into the interior of the bin for self service withdrawal

of commodities therefrom, the unit including a stand having an upper opening in which the receptacle freely seats.

3,650,385

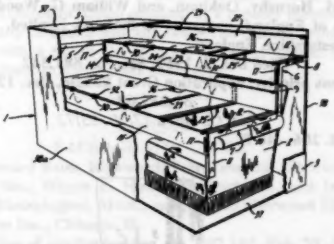
KNOCKDOWN PACKAGING UNIT

Maynard W. Eickhoff, 4124 W. Klehnau Ave., Milwaukee, Wis.

Filed May 5, 1970, Ser. No. 34,748

Int. Cl. B65d *81/00, 85/00, 9/00*

U.S. Cl. 206—46 FN **10 Claims**



The invention is directed to a packaging unit which can be readily assembled and disassembled. Under one embodiment of the invention, two separate frame members of different widths are secured to the inside of the ends of a packing box by hooks engaging apertures in metal strips secured to the inside of the box ends so that the frame members are readily removable and supported by the box ends. The frame members are located at different heights with the frame member located at the greatest height being at the rear portion of the ends of the box. The frame members are interchangeable to change the width of the frames at each respective height to accommodate furniture of different configuration within the packaging unit. The frames support the ends of horizontal protective panels and the panels are additionally supported between the frames by intermittent, readily removable brackets secured to base plates and backing plates which are of the same lengths as the panels. The furniture may be located in the packing box before the packaging unit is assembled, although after the unit is assembled, the rear part of the unit is open so that furniture, such as a davenport or overstuffed chairs may be inserted upon removal of the back panel, or before the panel is located in place. In another embodiment, the end frames are of one-piece, stepped construction and support themselves inside a packing box, but are also devised so that the panels at the two levels of the respective end frames may be interchanged.

3,650,386

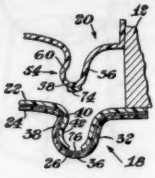
RESEALABLE CONTAINER

Ruben A. Tigner, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of application Ser. No. 750,111, Aug. 5, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 639,213, May 17, 1967, now Patent No. 3,454,158. This application Aug. 19, 1969, Ser. No. 851,309

Int. Cl. B65d *17/00, 85/76*

U.S. Cl. 206—46 F **16 Claims**



A resealable container including a hermetic seal joining together components of the container and which seal is so constructed that when broken, a pressure sensitive adhesive layer is exposed to provide a tacky surface for resealing purposes. Specifically, one of the components is a laminate. The seal causes a preferential separation of the plies of the laminated component with the adhesive layer being located at the interface of preferential separation.

3,650,387

CANS

John M. Hornsby, Oakham, and William G. Wood, Melton, both of England, assignors to Petfoods Limited, Leicester, Leicestershire, England

Filed Dec. 2, 1969, Ser. No. 881,542

Claims priority, application Great Britain, Dec. 12, 1968, 59,237/68

Int. Cl. B65d *17/20, 85/72*

U.S. Cl. 206—46 F **5 Claims**

A can has a metal end and a side wall of a different metal. Self-supporting sheet material which is water-impervious and electrolytically inert with respect to the metal of the side wall isolates the end from the contents of the can and serves to provide electrolytic corrosion of the end. Where the end is a tear-off end, the sheet also serves to preserve the contents from contamination if the tear-off end is damaged.

3,650,388

TAPE CANISTER

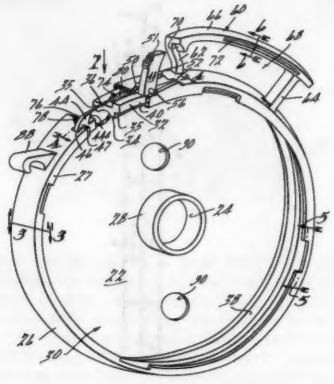
Boris M. Osojnak, Birmingham, Mich., assignor to Engineered Data Products, Inc., Ferndale, Mich.

Filed July 28, 1969, Ser. No. 845,298

Int. Cl. B65d *45/32, 85/67*

U.S. Cl. 206—52 F **16 Claims**

A canister for storing a tape reel, comprising a support or shell member of generally cup-shaped configuration and a split sealing ring positioned on the inner periphery of the rim portion of the support member and having a handle portion at one end projecting outwardly through the rim portion for manipulation by an operator so that the ring may be selectively expanded and contracted; the radially inner peripheral portion of the split ring has a width approximating the internal distance between the spaced reel flanges so that the ring may be expanded to allow passage of the leading flange of the reel and thereafter contracted to seat the radially inner peripheral portion of the sealing ring between the spaced flanges and thereby positively but readily releasably secure the reel within the canister.



3,650,389

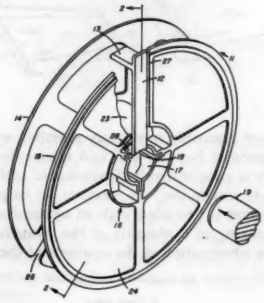
DEVICE FOR THE STORAGE AND HANDLING OF PHOTOGRAPHIC FILM OR THE LIKE

Dan Gilbert Mook, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 22, 1970, Ser. No. 5,039

Int. Cl. B65h *75/28*

U.S. Cl. 206—53 **3 Claims**



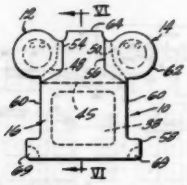
A device for the storage and handling of photographic film or the like including retaining means for holding the film securely to the device and release means for releasing the retainer means from its film-retaining position. In one embodiment the device may be in the form of a reel which includes retainer means for retaining the film on the reel and pivotable release means which may be actuated by positioning the reel on a spindle to pivot the retainer means from its film-retaining position to permit the film to be wound upon or unwound from the reel.

3,650,390

COMPOSITE PACKAGE AND METHOD OF FORMING SAME

Chung, Yun Hoon, Perrysburg, Ohio, assignor to International Automated Machines, Inc., Perrysburg, Ohio

Filed Aug. 14, 1970, Ser. No. 63,690
Int. Cl. B65d *51/16*
U.S. Cl. 206—56 AA 6 Claims



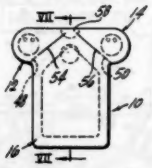
A composite package having three separably connected containers. The containers are initially formed integrally as receptacles in a base sheet of a self-supporting plastic material, each receptacle being open at its upper end and closed at the bottom. A cover sheet is bonded to the upper face of the base sheet to overlie the open ends of the receptacles. The cover sheet is formed with small product dispensing apertures which register with the open ends of two of the receptacles. The cover sheet completely overlies the open end of the third receptacle. A top sheet is applied over the cover sheet to complete the containers. The cover sheet is peelable from the base sheet and the top sheet is more easily peelable from the cover sheet. The three sheets are severed in a predetermined manner and along predetermined lines to facilitate separation of the containers from one another and to provide lift tabs facilitating peeling the sheets from one another when it is desired to dispense the product. The receptacles are filled with a product through the open upper ends thereof before the cover sheet is applied thereto. In one form of the invention the top sheet overlies only the receptacle where the cover sheet is provided with the small dispensing openings.

3,650,391

COMPOSITE PACKAGE AND METHOD OF FORMING SAME

Yun Hoon Chung, Perrysburg, Ohio, assignor to International Automated Machines, Inc., Perrysburg, Ohio

Filed Aug. 14, 1970, Ser. No. 63,819
Int. Cl. B65d *51/16*
U.S. Cl. 206—56 AA 7 Claims



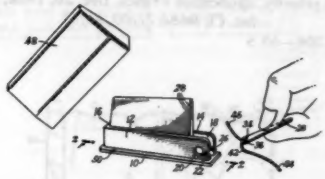
A composite package having three separably connected containers. The containers are initially formed integrally as receptacles in a base sheet of a self-supporting plastic material, each receptacle being open at its upper end and closed at the bottom. A cover sheet is bonded to the upper face of the base sheet to overlie the open ends of the receptacles. The cover sheet is formed with small product dispensing apertures which register with the open ends of the receptacles. A peelable top sheet is applied over the cover sheet to cover the dispensing openings. The three sheets are severed in a predetermined manner and along predetermined lines between the receptacles to facilitate separation of the containers from one another and to provide lift tabs facilitating peeling of the top sheet from the cover sheet when it is desired to dispense the product. The receptacles are filled with product through the open upper ends thereof before the cover sheet is applied thereto.

3,650,392

DENTAL BRIDGE CLEANER DISPENSER

Anton F. Haagedoorn, Gina Lane, Box 245, RFD #2, Bedford, N.Y.

Filed Jan. 14, 1971, Ser. No. 106,491
Int. Cl. A61c *15/00*; B65d *83/08*, *85/62*
U.S. Cl. 206—56 AC 7 Claims



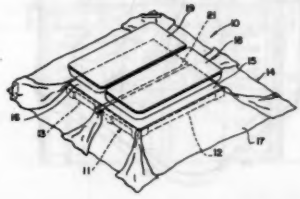
A dental bridge cleaner dispenser comprising a channel-shaped member in which a plurality of vertically arranged cleaner members are mounted on and slidably arranged in respect to a supporting rod having a resilient loop at one end. The walls of the channel have guide openings aligned with said resilient loop whereby a length of dental floss can be passed therethrough. Upon removal of a cleaner member it is automatically threaded with the floss. The cleaner member is provided with a notch for securing the floss against movement in respect to the cleaner member.

3,650,393

PACKAGE STRUCTURE

Robert Edward Reiss, Kirkwood; Fritz Deuschle, Shrewsbury, both of Mo.; Wayne E. Moll, Villa Park, Ill., and Jack D. Merry, Bloomington, Minn., assignors to Sherwood Medical Industries Inc., Chicago, Ill.

Continuation of application Ser. No. 707,165, Feb. 21, 1968, now abandoned. This application Mar. 3, 1970, Ser. No. 16,266
Int. Cl. A61b *19/02*; B65d *77/30*
U.S. Cl. 206—63.2 16 Claims



A packaged kit including an openable enclosure which is sealed in closed packaged arrangement with a set of articles compactly retained therein in sterile condition. The package structure further includes a flexible sheet enveloping the set within the closed package and arranged to define a passive sterile surface on which the articles are disposed when the package is opened. The articles may comprise a set of medical instruments, medicants, and the like suitable for performing a medical procedure such as a spinal anesthesia opera-

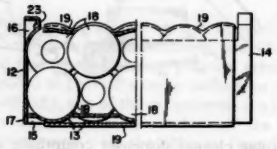
tion. The package structure is adapted to be delivered in a hospital pneumatic conveyor system. The package portions are retained in the sealed closed package arrangement by a removable tape. A label cooperates with the flexible sheet to define a hinge between the two portions for opening the enclosure in the manner of a book to make the articles therein accessible in the open arrangement. The label is placed on the outside of the package overlying the tape to further serve as a means for indicating the maintained closed condition of the package. The package is permeable for introduction of a sterilizing gas thereinto in the closed package arrangement.

3,650,394

PACKAGING DEVICE

De Cazenove, 28 rue de l'Orangerie, 78 Versailles, France

Filed Dec. 19, 1969, Ser. No. 886,482
Claims priority, application France, Dec. 20, 1968, 179425
Int. Cl. B65d *71/00, 85/62*
U.S. Cl. 206—65 S **8 Claims**



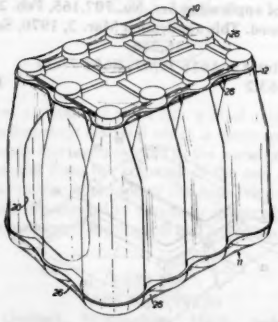
An array of bottles are held tightly on a support plate by a shrinkable plastic film enrobing the pack, the support plate having an array of retaining portions to position the bottles in tight contact with each other.

3,650,395

SHRINK WRAP PACKAGE HAVING THE CONTAINERS THEREIN IN CONTACTING RELATION

Reginald John Hobbs, Granville Works, Emery Road, Brislington Trading Estate, Bristol, 4, England

Filed Jan. 22, 1970, Ser. No. 4,993
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 E **3 Claims**



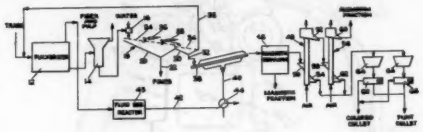
A package comprises a number of separate containers, the adjacent ends of which are located by a number of depressions or locating formations formed in a tray, and a taut sheet wrapping layer extending externally around both the containers and the tray: there may be top and bottom trays formed to locate the tops and bottoms of the containers, the wrapping layer extending around the containers and the two trays.

3,650,396

REFUSE SEPARATING AND SORTING METHOD AND APPARATUS

Robert M. Gillespie, and Hugh R. Rhys, both of Grand Rapids, Mich., assignors to Sortex Company of North America, Inc., Lowell, Mich.

Filed Nov. 18, 1970, Ser. No. 90,663
Int. Cl. B07c *5/342*
U.S. Cl. 209—3 **25 Claims**



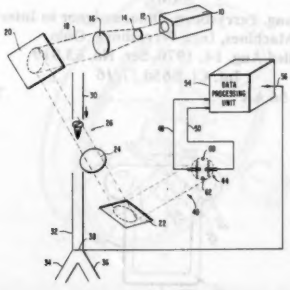
A method and apparatus for sorting refuse into its components for recycle. The refuse, which contains glass, metals, paper, etc., is first comminuted and a fibrous pulp fraction is removed. Magnetic materials are removed by magnetic separation and lighter metals such as aluminum are separated from a glass containing concentrate by entraining the light metal fraction in an upwardly moving air column. A glass containing fraction, which has been sized, washed, and dried, is then sorted according to color to separate one kind of glass, such as flint glass, from other kinds or colors of glass by sensing an optical property of the glass and thereafter mechanically separating the glass particles according to the value of the optical property sensed.

3,650,397

SYSTEM FOR INSPECTING AND CLASSIFYING OBJECTS SUCH AS SCREWS, BOLTS AND THE LIKE WHILE IN MOTION

Dwight D. Bornemeier, Ann Arbor, Mich., assignor to Sensors, Inc.

Filed Nov. 19, 1970, Ser. No. 90,886
Int. Cl. B07c *5/00*
U.S. Cl. 209—80 **12 Claims**



Inspection and grading system for threaded objects comprising sequential detection, measurement, and comparison of major and minor diametral values of a threaded object while in motion. Such values are determined along the pitch angle of the threaded object throughout its longitudinal length. Measurements are made cyclically as the object is guided through the detection zone. The measured values are evaluated e.g., by sequential comparison to computer stored values of a standard threaded object and accepted or rejected based on the selective discrimination level. The objects are counted and classified.

3,650,398

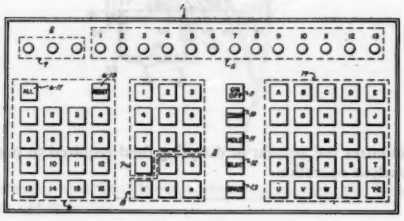
CONSOLE AND CONTROL CIRCUIT

Robert J. Kalthoff; Frederic R. G. Sanborn, and Daniel J. Bandenburg, all of Cincinnati, Ohio, assignors to O. K. Partnership, Cincinnati, Ohio

Original application Apr. 4, 1966, Ser. No. 539,792, now Patent No. 3,534,904. Divided and this application Apr. 13, 1970, Ser. No. 32,489

Int. Cl. B07c *5/00*

U.S. Cl. 209—80.5 **21 Claims**



A console and control circuit is disclosed for controlling document retrieval apparatus utilized in a retrieval system of the type wherein one or more documents notched in adjacent character fields arranged along one or more edges in accordance with a predetermined code are selected from a plurality of like documents randomly stored in a document storage compartment. The console and control circuit includes a keyboard unit having a plurality of selectively operable keys for generating character code signals corresponding to the coded data notched in the character fields of the edge of a document to be retrieved; means for generating a stepping signal each time one of the character keys is actuated; and means for transmitting the character code and stepping signals to character entry means associated with the retrieval system, to effect the sequential entry of the keyed characters into the character fields of the entry means as the entry means moves from field to field in response to said stepping signals. Additionally, included are a plurality of character field indicating means responsive to the stepping signals for visually indicating the character field at which the entry means, at any given time, is positioned. Also provided is a detachably mounted key indicating plate having labeled key receiving apertures therein for visually correlating the console keys with the character code signals thereby.

3,650,399

CODED CARD ASSORTING DEVICE AND SYSTEM

Joseph D. Shaw, 508 Church St., Brownsville, Pa.

Filed Nov. 4, 1970, Ser. No. 86,712

Int. Cl. B07c *3/04*

U.S. Cl. 209—80.5 **9 Claims**

The disclosure describes a coded card assorting device and system that processes one coded card at a time taken from a stack of such cards indiscriminately mingled in a pack, said device and process including a single, card transferer and a gravity operated discriminating means synchronized with the transferer; said device and system being adapted to intermittently take coded cards from the stack and deliver them into predestined bins.

3,650,400

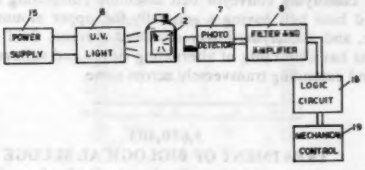
OPTICAL SENSING SYSTEM USABLE IN AMBIENT LIGHT

Charles W. Warren, Basking Ridge, and Richard J. Izdebski, Somerset, both of N.J., assignors to American Cyanimid Company, Stamford, Conn.

Filed Feb. 9, 1970, Ser. No. 9,589

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.5 **21 Claims**



A detection system, unaffected by ambient light, is provided for sensing the presence of luminescent material on labels, packages, and other articles. An ultraviolet light is pulsed at a predetermined frequency, and a photo-detector system is filtered to respond only to resulting radiations having that same pulse rate frequency. Control circuitry is provided for sorting packages and the like in response to readings of the detector.

3,650,401

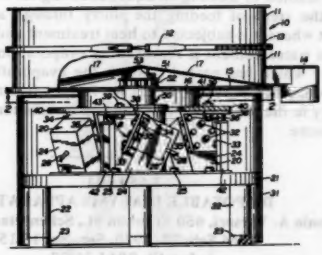
APPARATUS FOR VIBRATING A MATERIAL SEPARATOR

Laverne J. Riesbeck, Canton, and Wilson G. Mushrush, Carrollton, both of Ohio, assignors to Midwestern Industries, Inc., Massillion, Ohio and Wilson G. Mushrush, Carrollton, Ohio, part interest to each

Filed Nov. 28, 1969, Ser. No. 880,708

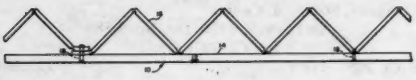
Int. Cl. B07b *1/28, 1/42*

U.S. Cl. 209—325 **9 Claims**



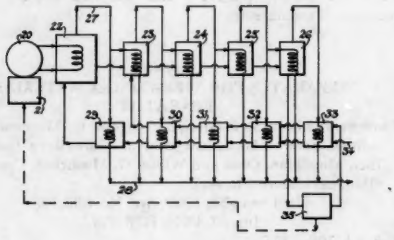
An apparatus for vibrating a material separator provides selective horizontal and vertical high frequency vibratory forces to the separator. The amplitude of the forces can be individually controlled while the machine is operating. The precise direction of the horizontal force can be set to obtain the desired pattern of material travel over the screen. Also disclosed is a manner in which the vibratory motion caused by the vertical component force can be utilized to prevent screen blinding.

3,650,402
STRATIFIER BELT ASSEMBLY
William A. Caldwell, Olathe, Kans., assignor to Phillips Petroleum Company
Filed Dec. 10, 1969, Ser. No. 883,687
Int. Cl. B03b 3/36
U.S. Cl. 209—430 9 Claims



A classifying conveyor belt assembly comprising an elongated base belt having a generally flat upper mounting surface, and a carrying cover mounted thereon. Said carrying cover has a plurality of alternating ridges and valleys formed in and extending transversely across same.

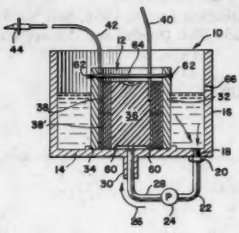
3,650,403
TREATMENT OF BIOLOGICAL SLUDGE
Anthony Peter Aldridge, Stockport, England, assignor to Simon-Carves Limited, Cheshire, England
Filed May 4, 1970, Ser. No. 34,177
Claims priority, application Great Britain, May 22, 1969, 26,151/69
Int. Cl. C02b 1/02
U.S. Cl. 210—180 2 Claims



A method of treating an aqueous biological slurry comprising the steps of feeding the slurry through an evaporator plant where it is subjected to heat treatment and where a part of its water content is removed by evaporation, filtering the slurry which has passed through the evaporation plant and recycling the aqueous filtrate for further treatment with the slurry in the evaporator plant and an installation for performing same.

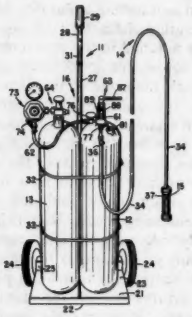
3,650,404
DISPOSABLE DIALYSIS APPARATUS
Antonio A. Versaci, 650 Franklin St., Schenectady, N.Y.
Filed Feb. 27, 1970, Ser. No. 15,155
Int. Cl. B01d 31/00
U.S. Cl. 210—238 8 Claims

A dialysis device that is adapted to be disposed of after a single use. A closed cell foam core is used as a support for a dialysis membrane and may be located in a chamber associated with a reservoir also of closed cell foam, with the core occupying a major portion of the chamber. A pump circulates dialyzing fluid from the reservoir to the chamber from which the fluid overflows back into the reservoir. The use of a foam core and reservoir permits the structure to be fabricated sufficiently economically to permit it to be disposed of after a single use and the use of a closed cell structure occupying a major portion of the chamber



minimizes the amount of dialyzing fluid required to perform a dialysis operation.

3,650,405
APPARATUS FOR CHLORINATING SWIMMING POOLS
Robert L. Morrison, 18219 Van Ness Ave., Torrance, Calif.
Filed Oct. 2, 1969, Ser. No. 863,104
Int. Cl. C02b 1/36
U.S. Cl. 210—241 5 Claims

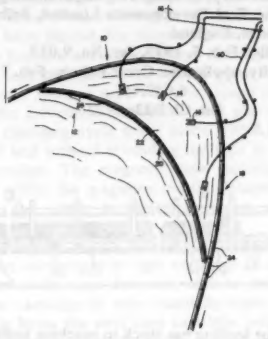


Portable apparatus for treating swimming pool water with chlorine gas wherein a source of chlorine gas is connected to a dispersion head adapted for introducing gas into water in the form of small bubbles. A source of carbon dioxide is also connected to the dispersion head, and valves are provided for successively delivering chlorine gas and carbon dioxide to the head for chlorinating the water and purging the system of chlorine gas.

3,650,406
OIL COLLECTION RETRIEVAL SYSTEM
Louis Stanislaus Brown; Frank Adams March, both of Reston; Richard Patten Bishop, Vienna, and Bruce Calvin Gilman, Annandale, all of Va., assignors to Ocean Systems, Inc., New York, N.Y.
Filed Oct. 12, 1970, Ser. No. 80,044
Int. Cl. C02b 9/02
U.S. Cl. 210—242 9 Claims

A system for collecting and retrieving a liquid of low density from the surface of a body of liquid of higher density which includes a catch basin having a floating weir as one section thereof through which the lower density liquid flows,

and means for retrieving the liquid from the interior of the basin. The floating weir consists of a buoyant upper section



and a water absorbent lower section representing the ballast for the upper section.

3,650,407

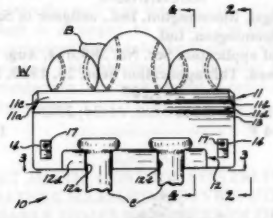
RACK FOR SPORTING EQUIPMENT

Oliver C. Benham, Jr., 7614 Romney, Houston, Tex.

Filed July 9, 1970, Ser. No. 53,467

Int. Cl. A47f *7/00*

U.S. Cl. 211—14 **6 Claims**



A wall mountable rack for storing small balls, baseball bats, baseball gloves and related accessories such as baseball caps and uniforms. The rack includes a single piece body with vertically spaced, upper and lower shelf-like projections extending away from a connecting backing structure. The top projection includes an upstanding, three-sided wall surrounding an inclined ledge. The lower shelf is indented to receive and hold the handle end of ball bats. The rack is adapted to be connected to a supporting wall by bolt or screw means. Two separable hooks employed to support gloves, caps, jackets and the like are secured to the main rack body below the upper shelf by the same screws or bolts employed to mount the body against the wall.

In a modified form, the rack is integrally formed in a single piece with pegs projecting from the backing structure of the rack body. The pegs include bores extending through their lengths through which a bolt or screw means may be employed to simultaneously secure the rack to the wall and provide reinforcing for the pegs.

3,650,408

DISPLAY APPARATUS

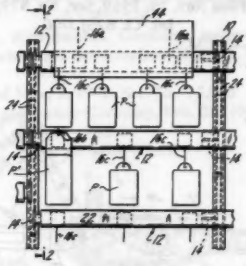
Robert Fisher, Whitestone, and Milton W. Herzog, Valley Stream, both of N.Y., assignors to H. Goodman & Sons, Inc., Kearny, N.J.

Filed Oct. 6, 1969, Ser. No. 863,844

Int. Cl. A47f *7/00*

U.S. Cl. 211—57 **11 Claims**

Display apparatus here includes vertical supports carrying plural horizontal channels. There are display carriers easily assembled to the channels and individually adjustable along the channels. Each display carrier includes a mounting plate and a rod for supporting merchandise or for acting with another rod for supporting a display card. The channel has in-turned lips, the upper lip being wider than the lower lip, and the mounting plate of the display carrier is of the proper width to be tucked under the upper lip, swung against the wall of the channel between the lips and shifted into the groove formed between the bottom lip and the wall of the



channel, then being captive behind the upper lip. The lips extend from the rear of the channel, so that the wall of the channel has an unobstructed front appearance, and it can be used for signs, etc. The rods of the display carriers extend from the plates at the rear of the channel, across the top or bottom edge of the channel, to the display space in front of the channel.

3,650,409

APPARATUS FOR UNLOADING CONVEYED BOOKS

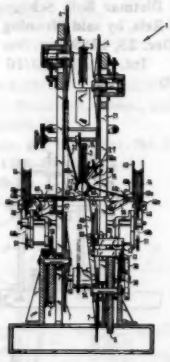
Heinz Klostermann, Wehdem, Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Rahden, Germany

Filed Sept. 30, 1970, Ser. No. 76,951

Claims priority, application Germany, Oct. 4, 1969, P 19 50 186.1

Int. Cl. B65g *29/00*

U.S. Cl. 214—1 QA **14 Claims**



Books conveyed by a conveyor are unloaded by a pair of pockets having common inner lateral wall means and bottom means, and outer lateral wall means which are mounted for independent movement on the bottom means. During operation, one of the pockets is moved transversely to the conveyor movement from a receiving position receiving a book to a holding position for removing a book from the conveyor, while the respective other pocket assumes the receiving position whereupon the outer wall means of the pocket in the

holding position is moved further to a horizontal or downwardly inclined position for transferring the books by a transfer rake to a conveyor of two other conveyors respectively cooperating with the two outer movable wall means.

3,650,410

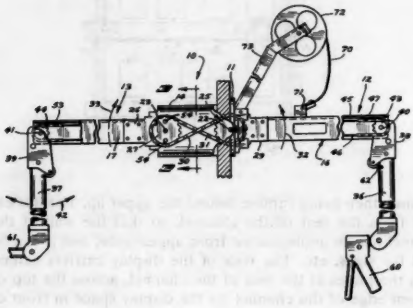
TRUE MOTION MINIATURE MANIPULATOR

Robert W. Wiesener, Roseville, Minn., assignor to Programmed & Remote Systems Corporation, St. Paul, Minn.

Filed Nov. 25, 1969, Ser. No. 879,838

Int. Cl. B25j *3/00*

U.S. Cl. 214—1 CM **10 Claims**



A compact or miniature master-slave manipulator which is made primarily for light duty work, and which is inexpensive to manufacture. Structure is employed which permits the true motion of the arms of the manipulator, so that when the master side is raised, the slave side will also be raised, for example.

3,650,411

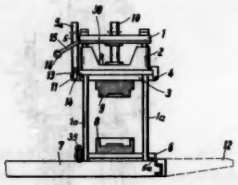
DEVICE FOR FINISHING COMPLEMENTARY PARTS

Walter Reis; Helmut Pfenning, both of 8753 Obernburg/Main, and Dietmar Boll, Schippach, all of Germany, assignors to said Reis, by said Pfenning and said Boll

Filed Dec. 23, 1969, Ser. No. 887,500

Int. Cl. B21j *13/10*

U.S. Cl. 214—1 QD **15 Claims**



A device for finishing complementary die or mold parts and similar complementary parts has a base plate for supporting a part to be finished in upwardly facing position. The support plate is slidable between a lowered position in which the two parts complement or otherwise coact with each other and a raised position in which the two parts face each other spaced apart, and is also swingable into a position in which the parts are in substantially planar alignment both facing upwardly, whereby both parts are conveniently accessible for finishing.

3,650,412

BAR STOCK FEED MECHANISM

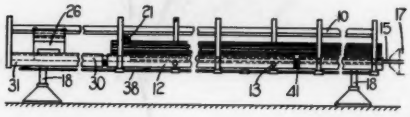
Richard William Neary, Bromsgrove, England, assignor to Atlantis Machine Tool Developments Limited, Belbroughton, near Stourbridge, England

Filed Feb. 5, 1970, Ser. No. 9,013

Claims priority, application Great Britain, Feb. 7, 1969, 6,639/69

Int. Cl. B23q *5/22*

U.S. Cl. 214—1.5 **2 Claims**



Mechanism for feeding bar stock to machine tools in which the feeding is effected by a linear motor. The linear motor is arranged for movement parallel to means for supporting the bar to be fed in alignment with the headstock of the machine tool, the movable part of the motor being connected to a pusher arranged to bear against a bar supported on the means.

3,650,413

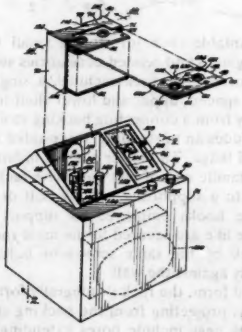
AUTOMATIC TAPE CARTRIDGE CHANGING MECHANISM

Morton L. Weigel, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Continuation of application Ser. No. 389,014, Aug. 12, 1964, now abandoned. This application Sept. 25, 1969, Ser. No. 861,207

Int. Cl. G11b *5/00, 15/24, 23/04*

U.S. Cl. 274—4 F **104 Claims**



A removable or detachable magazine is provided which receives and stores a plurality of flat rectangular magnetic tape cartridges. Each cartridge is provided with two reels on which a short length of tape is wound, the ends of the tape being secured to the reels. An automatic cartridge changing mechanism is provided with a magazine receiving well into which the loaded magazine may be placed with either one of two orientations. When the magazine is placed in the well in one orientation a driveshaft is positioned within the central aperture of one group of reels of the cartridges positioned within the magazine, and when the magazine is positioned with the reverse orientation, the driveshaft is positioned within the central apertures of the other reel in each cartridge.

When the end of a particular tape is reached, means are provided responsive to the increase in tension in the tape for initiating an automatic tape changing cycle during which the transducer head is automatically withdrawn from the tape which has been played, the magazine is moved upwardly in the well to position another cartridge for engagement by the driveshaft, and the transducer head is then moved into engagement with the new tape which is wound on the reel surrounding the driveshaft during the next playing cycle. This automatic changing cycle takes place within approximately one second and without rewinding the tape in the previously played cartridge. The magnetic tape cartridges which are positioned within the magazine are thus played in rapid succession in the order in which they are placed in the magazine.

A tape cartridge reject means is provided for manually shifting from one magnetic tape cartridge to another at any time so that if the user does not wish to start or continue playing one cartridge he may manually reject this tape and immediately bring the next tape cartridge into playing position, in a manner comparable to the manual reject action of a conventional disc record changer.

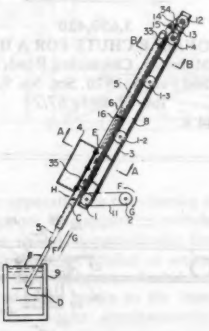
The magazine is locked in its selected position in the well at all times during which the transducer head is in contact with one of the cartridges so as to prevent inadvertent movement of the tape while the head is in engagement therewith. However, when all of the cartridges in the magazine have been played, the transducer head is moved away from the tape in the last cartridge, the machine is automatically turned off, and an indication is made that the magazine may be bodily removed from the machine. The magazine may now be inserted into the well with the opposite orientation so that the driveshaft is arranged to rewind the tapes within the respective cartridges back onto the reels on which they were originally wound. The selections on the other sound channel of each cartridge are thus each played in rapid succession but in the reverse order.

3,650,414

AUTOMATIC CONTROL SYSTEM FOR A TEMPERATURE MEASURING DEVICE UTILIZING AN EXPENDABLE IMMERSION THERMOCOUPLE UNIT

Yutaka Asada; Tatsuichi Obinata, and Kamematsu Matsuda, all of Kitakyushu, Japan, assignors to Osaka Sanso Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1970, Ser. No. 22,843
Claims priority, application Japan, Apr. 5, 1969, 44/26000
Int. Cl. B65g *59/06*
U.S. Cl. 214—8.5 F **4 Claims**



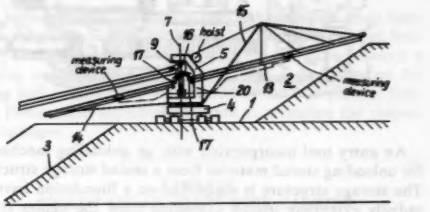
A holder for removably holding a member to be immersed into a molten metal bath in a furnace or a vessel, such as a ladle, is mounted on a fixed frame so as to be moved reciprocally toward and away from the furnace. Along the path of the holder are provided means for supplying said members one by one in the path of the holder, and means which is adapted to automatically mount the member thus supplied onto the holder during the movement of the holder toward the furnace and to automatically dismount the same from the holder during the return stroke of the holder to its original position.

3,650,415

ARRANGEMENT FOR UNLOADING MATERIAL FROM A DREDGE

Alfred Krumrey, Rheinhausen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 2, 1970, Ser. No. 15,805
Claims priority, application Germany, Feb. 28, 1969, P 19 10 242.2
Int. Cl. B65g *65/28*
U.S. Cl. 214—10 **9 Claims**



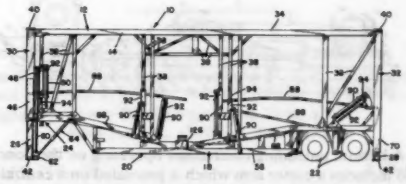
An arrangement for dumping dredged material on an elevated bank and a below grade bank by means of a removing device, the superstructure of which is mounted on the understructure so as to be tiltable about a vertical axis and which receives the dredged material through the intervention of a belt bridge in close vicinity of the vertical pivot axis, the superstructure comprising two dumping beams for the dumping on an elevated and a below grade bank, which dumping beams are pivotable together with the superstructure, while below the discharge end of the belt bridge there is provided an adjusting device for the two dumping beams for varying the material to be dumped thereby.

3,650,416

VEHICLE CARRIER

Bert A. Bodenheimer, Stamford, Conn., assignor to Sea-Land Service, Inc., Elizabeth, N.J.

Filed Jan. 22, 1970, Ser. No. 4,972
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R **9 Claims**



A wheeled cargo carrier adapted for over-the-road travel as well as for stacking interchangeably with other cargo carriers aboard a ship includes a single or a plurality of adjustable ramps for supporting a number of vehicles thereon. The irregular shaped frame of the carrier includes supports dis-

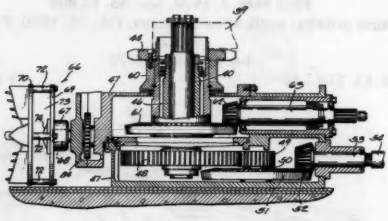
placeable from a retracted position when the carrier is adapted for over-the-road use, to extended positions for defining a stackable unit when the carrier is to be stored aboard a ship.

3,650,417

ENTRY TOOL FOR UNLOADING MECHANISM

Fred W. Dissmeyer, Elgin, and George E. Olson, Arlington Heights, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Apr. 15, 1970, Ser. No. 28,850
Int. Cl. B65g 65/42
U.S. Cl. 214—17 DA 12 Claims



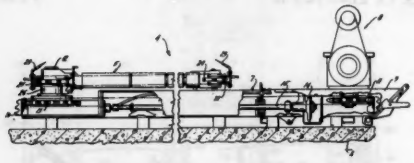
An entry tool incorporated with an unloading mechanism for unloading stored material from a sealed storage structure. The storage structure is supported on a foundation having a radially extending trough extending from the center of the structure to the exterior and conveyor members are located in spaced parallel relation within the trough, while a stationary backbone or frame of a separate cutter arm assembly is located within the trough between the conveyor members. An entry tool is associated with a center post assembly at the inner end of the backbone, and as the cutter arm assembly is installed in the structure, the entry tool dislodges the stored material located within the trough between the conveyor members and throws the dislodged material laterally outward to the conveyors so that the cutter arm assembly can be installed within the trough.

3,650,418

BOTTOM UNLOADER WITH OVERRUNNING CLUTCH

Fred W. Dissmeyer, Elgin, and George E. Olson, Arlington Heights, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Nov. 9, 1970, Ser. No. 87,878
Int. Cl. B65g 65/42
U.S. Cl. 214—17 DA 4 Claims



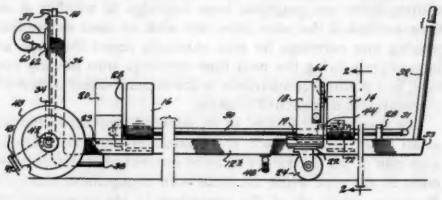
A bottom unloading mechanism operating on the floor of a silo includes a cutter arm which is journaled on a central post at the center of the silo for rotation over the floor of the silo. The cutter arm has an endless cutter chain that dislodges the stored material and moves it toward the center of the silo where it is delivered to a discharge conveyor unit disposed in a radially extending trough in the silo floor. The cutter chain is driven by the conveyor unit when operating in one direction only and for that purpose a transmission in the central post includes a driven sprocket powered by the conveyor unit and transferring rotation in one direction to a second drive sprocket for the cutter chain by means of an overrunning clutch mechanism.

3,650,419

CLOTH DOFFING MECHANISM

Littleton Upshur, Greensboro, N.C.; Burton P. Franklin, Danville; Asa E. Roane, Redford, both of Va., and Kenneth Y. Wang, Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 25, 1970, Ser. No. 13,968
Int. Cl. B65g 67/02
U.S. Cl. 214—38 B 8 Claims



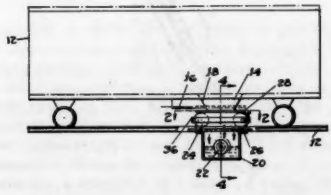
A mechanism is described for removing a filled cloth roll from a loom and for transporting a plurality of said removed said filled cloth rolls away from the loom area. A doffing cart is provided which is adapted to be placed adjacent the horizontally extending filled cloth roll on the loom and includes means for lifting the roll, when detached, horizontally onto the cart. The doffing cart with the filled cloth roll secured thereto may then be lifted to an upright position, where the filled cloth roll extends vertically, and the doffing cart may then be rolled away from the loom in the narrow aisles generally provided between looms. A receiving cart is provided which is adapted to receive the filled cloth roll from the doffing cart, store a plurality of said rolls and transport said plurality of rolls away from the loom area. Further, the receiving cart may store a number of empty rolls for installation in the looms when the filled rolls are removed therefrom. The doffing cart includes a tongue means adapted to be engaged with a coupling bar on the receiving cart placing the platform which supports the vertical filled cloth roll on the doffing cart substantially flush with the floor of the receiving cart so that the filled cloth roll need only be slid from one cart to the other.

3,650,420

REMOVABLE CHUTE FOR A HOPPER

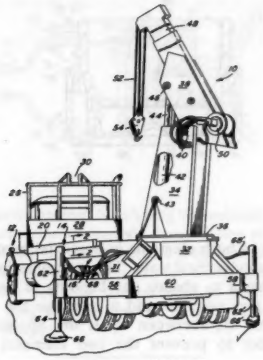
Joseph Francis Mahaney, Chickering Road, Spencer, Mass.

Filed Feb. 6, 1970, Ser. No. 9,226
Int. Cl. B65g 67/24
U.S. Cl. 214—44 R 5 Claims



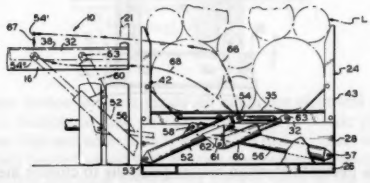
An inflatable member in the form of a synthetic or rubber annulus for application to the lower end of a hopper, providing a tight connection between the hopper and a receiving vessel below it.

3,650,421
HYDRAULIC UNLOADER
William H. Miller, Flowing Springs Road, Birchrunville, Pa.
Filed Apr. 17, 1970, Ser. No. 29,580
Int. Cl. B66f 1/54
U.S. Cl. 214—77 3 Claims



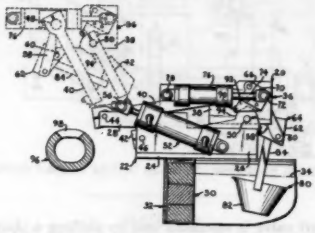
A hydraulic unloader is disclosed for attachment to the chassis of a truck. The unloader includes a turret having an extensible boom and rotatable through 360° at the rear end of the truck. The unloader includes a box frame welded to the chassis. The box frame is provided with horizontally extensible and vertically adjustable outriggers.

3,650,422
SIDE TRANSFER APPARATUS
Dossie M. Batson, Milwaukie, Oreg., assignor to Logging Systems, Inc., Portland, Oreg.
Filed Sept. 2, 1969, Ser. No. 854,591
Int. Cl. B65g 67/12
U.S. Cl. 214—146.5 14 Claims



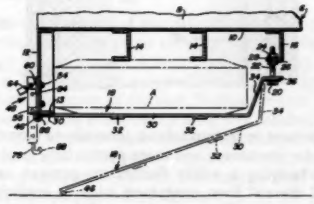
A side transfer apparatus for transferring a load to or from a vehicle load support. The apparatus includes a pair of load-supporting bunks spaced longitudinally from one another alongside the vehicle to be loaded or unloaded. The bunks are supported on base members which house multiple fluid cylinders connecting the bunks to the base members. The cylinders move the bunks simultaneously upwardly and laterally toward the vehicle load support along a curved path to clear the vehicle. Then the bunks pass generally vertically through the horizontal plane of the vehicle load support to either deposit a load on the vehicle support or lift a load therefrom as desired.

3,650,423
MECHANICAL LADLE
John W. O'Brien, 607 South Kelly, Harrison, Ark.
Filed July 23, 1970, Ser. No. 57,583
Int. Cl. E02f 3/42
U.S. Cl. 214—149 10 Claims



A ladle mounted on non-parallel linkage which is, in turn, carried by parallel linkage. Articulation of the parallel linkage provides translatory movement for the ladle between a loading and unloading station and the ladle is tipped for filling and emptying by articulation of the non-parallel linkage. Power units separately operate to articulate the respective linkages.

3,650,424
PICKUP TRUCK SPARE TIRE CARRIER
Hugh D. Dumas, Box 1121, Havre, Mont.
Filed Dec. 19, 1969, Ser. No. 886,456
Int. Cl. B62d 43/00
U.S. Cl. 214—454 4 Claims

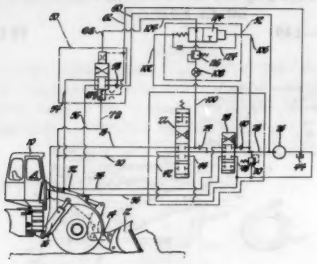


An underslung spare tire carrier for a pickup truck structurally designed and adapted to take the spare tire out of the box-type body and suspend it under the bed or bottom of the box where it can be conveniently unlatched and readily removed for use. No tools, special or otherwise, are needed. A yieldable rack cradles and clampingly stores the tire. This rack is hinged and the rearward end is freed when unlatched, swings down and unloads the tire at will.

3,650,425
BUCKET LOADER CONTROL SYSTEM
Russell H. Hallman, Royal Oak; John B. Keir, Birmingham, and Lawrence J. Patritto, Madison Heights, all of Mich., assignors to Sperry Rand Corporation, Troy, Mich.
Filed June 12, 1970, Ser. No. 45,741
Int. Cl. B66f 9/00
U.S. Cl. 214—762 3 Claims

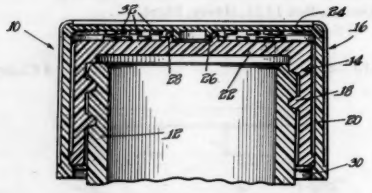
A material handling bucket loader with hydraulic boom lifting and bucket curling has an automatic control for bucket curling during the loading operation to assure filling of the bucket. The pressure developed in the boom lift system is utilized to open a normally closed curl valve when the load on the boom reaches a predetermined value which is

manually adjustable. Manual override of the automatic curl valve is achieved by sensing the flow which occurs when the



manual curl valve is operated and by shifting a shuttle valve in response to such flow.

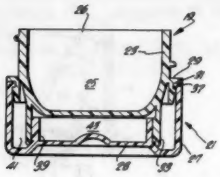
3,650,426
SAFETY CAP
Christian F. Miller, Palos Park, Ill., assignor to V.C.A. Corporation
Filed Mar. 30, 1970, Ser. No. 23,730
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 **11 Claims**



The present invention relates generally to closure members or caps for containers and more particularly to closure members embodying a safety feature to prevent unauthorized removal thereof from containers such as medicine receptacles and the like. The embodiment of the invention disclosed herein includes an inner inverted cup-shaped internally threaded closure member and an outer inverted cup-shaped member adjacently superimposing the inner member. These parts are secured against unintentional axial separation and the outer member is normally freely rotatably with respect to the inner member. The top of the outer member is axially deflectable and protuberance means is arranged to releasably couple the inner and outer members upon deflection of the outer member.

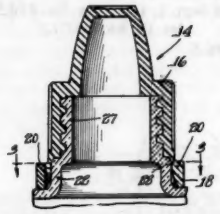
3,650,427
TWO PIECE DOUBLE WALLED CONTAINER
Ernest Franklin, Beverly Hills, Calif., assignor to VCA Corporation, Greenwich, Conn.
Filed Aug. 19, 1970, Ser. No. 64,964
Int. Cl. A41J *41/00*
U.S. Cl. 215—13 R **12 Claims**

A two piece double walled container is disclosed comprising a first and second element. The first element is a cup-shaped member having a cylindrical wall and a bottom wall forming a compartment for receiving cosmetics or the like. The second element is also of a cup-shaped configuration having a cylindrical and bottom walls of slightly larger dimensions in order to extend over the first element in a spaced relationship to form an insulative thermal air pocket therebetween. The coupling means for uniting the two elements comprises a grooved annular collar formed on the periphery of the cylindrical wall of the first element for receiving a plurality of projections extending inwardly from the rim of the second element. A pair of tightly fitting frictionally interengaging tubular extensions are formed on the



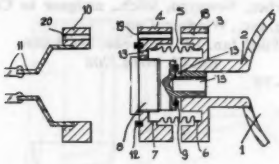
bottom walls of both elements in a coaxial relationship with respect to the cylindrical walls. The interengaging tubular extensions function to absorb any bending or axial loads applied to the two elements and to increase the frictional interengagement therebetween upon the application of the loads in order to prevent the two elements from being separated.

3,650,428
TAMPERPROOF CLOSURE DEVICE
Christian F. Miller, Palos Park, Ill., assignor to V.C.A. Corporation (formerly k/a Valve Corporation of America), Greenwich, Conn.
Filed Apr. 9, 1970, Ser. No. 27,062
Int. Cl. B65d *41/32*
U.S. Cl. 215—42 **8 Claims**



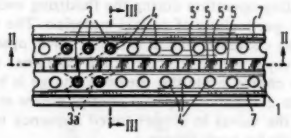
The present invention relates generally to closure members for application to external thread convolutions of a container and more particularly to an improvement in such closure members whereby unauthorized or unintentional unscrewing of the closure may be readily detected. The embodiments of the present invention disclosed herein include an internally threaded closure member or cap and a locking ring fracturably connected with the lower margin of the cap. Ratchet teeth provided along the inner surface of the locking ring are adapted to interlock with complementary external teeth or protuberances on the container to resist forces tending to unscrew the cap after it has been finally tightened in place. If the cap is subjected to sufficient force tending to unscrew the cap while the ratchet teeth abut the external container protuberances, the fracturable connection will rupture, thereby affording a clear indication that the cap may have been tampered with.

3,650,429
SYSTEMS FOR SEALING ENCLOSURES
Pierre Ribout, Paris, France, assignor to Thomson-CSF
Filed Jan. 23, 1970, Ser. No. 5,315
Claims priority, application France, Feb. 4, 1969, 6902398
Int. Cl. H01j *61/30*
U.S. Cl. 220—2.1 R 9 Claims



A closing arrangement for closing the exhaust tip of evacuated enclosures comprising two flanges, one of which is associated with the tip and a central plug associated with the other flange and which closes the tip. Ducts are provided for connecting the tip with the outside. A joint is provided between the plug and the tip and flexible bellows interconnect the two flanges.

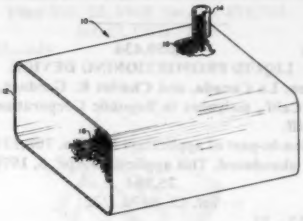
3,650,430
HOLDER FOR MASS-PRODUCED MINIATURE ELECTRICAL COMPONENTS, ESPECIALLY SEMICONDUCTOR MEMBERS
Wolfgang Siegmar, and Hans Wissinger, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Aug. 27, 1969, Ser. No. 853,360
Claims priority, application Germany, Sept. 3, 1968, P 17 64 913.7
Int. Cl. B65d *73/02, 75/22*
U.S. Cl. 220—23.8 5 Claims



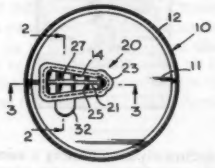
Holder device for mass-produced miniature electrical components includes at least two profiled bands of elastic plastic material disposed substantially parallel to one another, one of the bands being formed with at least one recess for receiving a respective electrical component therein, both of the bands having at least one row of pushbutton-like hollow projections, the hollow projections of one of the bands being inserted in respective ones of the other of the bands so as to hold the bands so tightly together that the component received in the recess is held firmly therein by both of the bands.

3,650,431
SAFETY CONTAINER
Dan F. Stewart, Memphis, Tenn., assignor to Phillips Petroleum Company
Filed Dec. 19, 1969, Ser. No. 886,663
Int. Cl. B65d *25/14*
U.S. Cl. 220—88 R 10 Claims

A bulked or textured filamentary plastic material is employed in a fuel tank or other container as a means for reducing explosion hazard and/or as an anti-sloshing means.

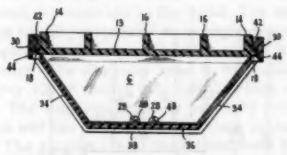


3,650,432
RE-USABLE SEAL FOR TAB OPENING CANS
Waldron Albert Easton, 1850 Camden Ave., Los Angeles, Calif., and Mark Allan Haidy, 14108 Tahiti Way, Marina Del Rey, Calif.
Filed Apr. 2, 1970, Ser. No. 25,041
Int. Cl. B65d *41/00*
U.S. Cl. 220—42 B 20 Claims



A re-usable seal for cans of the pull-tab type. The seal consists of a unitary structure of an abrasion-resistant elastomer. The structure has a dependent skirt portion forming a small angle such as 10° with a line perpendicular to the edge of the can to facilitate insertion of the seal. Within the skirt portion and a flat base portion is disposed a system of reinforcing ribs which preferably intersect each other at right angles for reinforcing the structure while permitting it to be deformed into the aperture of the can. A flat tab may extend from the seal structure to facilitate removal of the seal.

3,650,433
VERTICALLY MOUNTED DISPENSER WITH SLIDABLE COVER
John C. Robertson, Orange, N.J., assignor to The Stanley Works, New Britain, Conn.
Filed Feb. 9, 1970, Ser. No. 9,593
Int. Cl. B65d *83/08*
U.S. Cl. 221—65 13 Claims



A dispenser for replaceable knife blades has a support member with a shelf portion providing a shelf surface extending generally horizontally and a cover member which is slidable over the shelf portion. The cover member is secured in engagement with the support member and has apertures therein for effecting movement of the uppermost blade out-

wardly through the side thereof. As the blades are dispensed, the cover member slidably descends relative to the shelf portion.

3,650,434

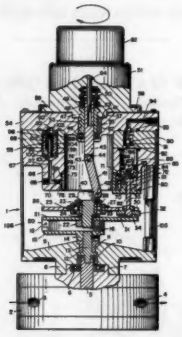
LIQUID PROPORTIONING DEVICE

Jay Johnson, La Canada, and Charles R. Gardner, Glendale, both of Calif., assignors to Republic Corporation, Century City, Calif.

Continuation-in-part of application Ser. No. 708,131, Feb. 26, 1968, now abandoned. This application Apr. 6, 1970, Ser. No. 25,964

Int. Cl. B67d 5/22

U.S. Cl. 222—31 1 Claim



A device for accurately maintaining a constant volumetric proportion between liquids delivered to a mixing point. The device includes means for positively metering the volume of a principal liquid; means for controllably pumping a secondary liquid, means for utilizing the output of the metering apparatus to operate and control the pumping apparatus; means for passing the secondary liquid to and away from the pumping apparatus; means for manually establishing a desired volumetric proportion between the principal and secondary liquids, and means for registering the volume of primary liquid which has passed through the positive metering apparatus. The device is particularly useful in applications wherein the volumetric proportion of a principal liquid to a secondary liquid in a mixture must be accurately controlled.

3,650,435

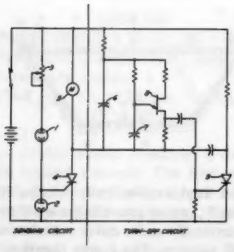
PHOTOELECTRIC CONTROLLED DISPENSER

William E. Kleefeld, Columbia Station, Ohio, assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1970, Ser. No. 25,445

Int. Cl. B67d 5/08

U.S. Cl. 222—52 3 Claims



A device is disclosed for dispensing materials such as detergents without manual control. It is operated by blocking the passage of light to one of two photoelectric cells, as by a hand, which actuates an SCR circuit. The pump is turned off automatically preferably by a pulse generating circuit which interrupts the SCR. The two photocells are connected in series and together function as a voltage divider, comparing ambient light to proximate light.

3,650,436

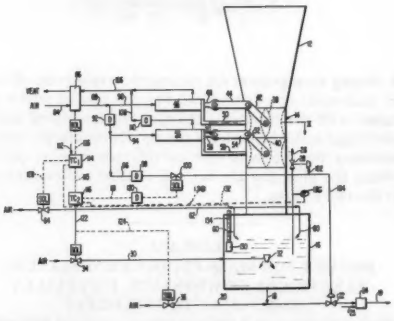
PNEUMATIC CONVEYOR AND BLENDER

Edgar A. Barber, Newaygo, Mich., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 19, 1970, Ser. No. 3,886

Int. Cl. B67d 5/08

U.S. Cl. 222—70 15 Claims



This disclosure relates to a system for fluidizing and transporting particulate material. The particulate material is fed into a fluidizing container from a hopper through two independently operated, serially arranged valves. The valves are controlled such that the closest valve to the container is opened first and closed last, after a charge has been delivered to the container to prevent flow of pressurized air through the hopper. Special blending nozzles are disclosed for an optional blending operation during the fluidizing and transporting process, particularly of certain materials. The outlet conduit from the container has an isolating valve, upstream from a fluid conveyor means, to permit the container to be filled with a new charge while the previous charge is being transported to its destination. Special control means are provided to operate the valves in proper timed sequence to minimize the time cycle for each charge.

3,650,437

AUTOMATED BIOLOGICAL REACTION INSTRUMENT

Gerald F. Binnings, Arcadia; Theodore N. Meyer, Westminster, and Mel J. Riley, Covina, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

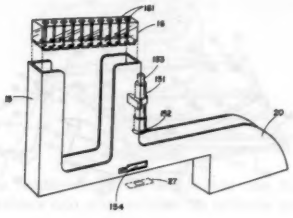
Original application May 9, 1968, Ser. No. 727,859, now Patent No. 3,574,064. Divided and this application Apr. 23, 1970, Ser. No. 43,283

Int. Cl. B67d 5/52

U.S. Cl. 222—136 1 Claim

This disclosure describes apparatus for automatically processing special laboratory slides carrying specific antigenic material with samples of blood serum taken from patients to detect the presence of specific antibodies in the serum as an indication of previous exposure to the antigen. Specifically, the disclosure describes the apparatus as applied to the fluorescent treponemal antibody (FTA) test for syphilis using an indirect fluorescent antibody technique with T. pallidum (Nichols strain) as the antigen. The apparatus of the invention includes a mechanism for discharging from a magazine a number of antigen carrying laboratory slides onto

a rotating carrier and the dispensing of samples of patients serum onto the laboratory slides. This is followed by the incubation of the slide carrying the previously fixed antigen and the patients serum for several minutes to allow the reaction of any specific antibodies in the serum with the fixed antigen. The apparatus further includes means for washing to remove excess serum, means for injecting a conjugate which



reacts with the human serum affixed to the antigen and carries a fluorescent tag such as fluorescein isothiocyanate. The apparatus includes means for further incubation to insure the reaction between the antigen-antibody complex and the conjugate followed by further washing and discharging of the reacted slides to an off-loading mechanism for subsequent examination under a laboratory microscope.

3,650,438

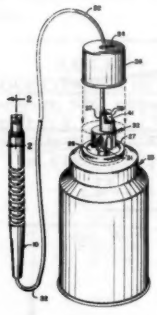
REMOTE DELIVERY NOZZLE AND PRESSURIZED CONTAINER ASSEMBLIES

George M. Stephenson, R.D. No. 1, Honey Hill Road, Georgetown, Conn., and Charles A. Soriano, Fairfield, Conn., assignors to said Stephenson, by said Soriano

Filed Dec. 9, 1969, Ser. No. 883,551

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.22 **7 Claims**



A pressurized container, incorporating a tiltable upstanding valve stem in a top release valve, is provided with a rotatable cap having an eccentric camming aperture aligned to cause tilting and re-erection of a mating eccentric sleeve telescopingly mounted on the tiltable valve stem, and thereby arming and disarming a remote release nozzle by supplying pressure from the pressurized container through an elongated length of flexible tubing to the remote release nozzle upper command. The remote release nozzle is provided with a manual actuator tip for sensitive manual control of the pressurized gas delivered therethrough.

3,650,439

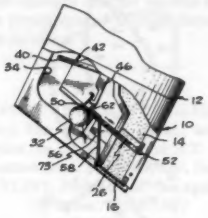
AUTOMATIC SUGAR DISPENSER

Mike S. Shimooka, 2612 Kaaha St., Honolulu, Hawaii

Filed Nov. 25, 1969, Ser. No. 879,744

Int. Cl. G01f *11/28*

U.S. Cl. 222—445 **11 Claims**



A dispensing mechanism that fits on a sugar jar, which dispenses exactly one teaspoon of sugar every time the jar is tilted. The mechanism includes a measuring chamber which holds one teaspoon, the chamber having an inner end leading to the sugar in the jar and an outer end leading to the outside, each end of the chamber having a cover. A ball which moves through a passageway in the mechanism operates the covers when the jar is tilted. As the jar is tilted, sugar pours into the chamber to fill it, then the cover on the inner end of the chamber closes, and then the cover on the outer end of the chamber opens to dispense the sugar therein.

3,650,440

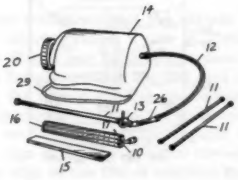
APPLICATOR FOR FLOORING MATERIALS

Jerry T. Gorniak, 2317 East 43rd St., Erie, Pa.

Filed Apr. 7, 1970, Ser. No. 26,238

Int. Cl. B65d *25/42*

U.S. Cl. 222—565 **2 Claims**

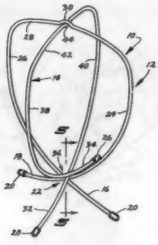


A device for applying a floor covering in the liquid state made up of a tank suitable to be carried on the shoulders of an operator. A hose is connected to the bottom of the tank. A hollow wand or pipe is connected to the hose and a dispenser head is connected to the wand. The wand extends upward from the dispenser head at an angle of approximately 30°. The liquid can flow from the tank to the head when a valve is opened. The dispenser head in its preferred form is approximately 12–24 inches long and 2 inches wide, and 1 inch deep. The dispenser head is generally rectangular in cross section and has three parallel grooves extending across its bottom. The grooves are V-shaped and each has a row of holes at its apex extending from one end of the dispensing head to the other. The wand is connected to one end wall of the dispensing head. The holes in each row are staggered from the holes in the other so that streams of liquid from the holes are evenly distributed over the floor and a smooth coating results. The method of applying liquid flooring by applying parallel streams is also part of the invention.

3,650,441
WIG SUPPORT

Edwin A. Lindgren, Osseo, Minn., assignor to Wire Specialty Manufacturing, Inc., Brooklyn Park, Minn.

Filed Nov. 17, 1970, Ser. No. 90,353
Int. Cl. D06c *15/00*
U.S. Cl. 223—66 10 Claims

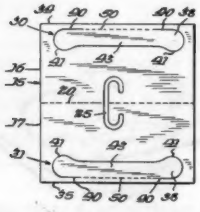


A wig support formed from two wire members is disclosed where the members releasably interfit to define a hollow three-dimensional figure and are separable with gentle pressure to thereby form two individual pieces which occupy a lower volume for more compact storage than the three-dimensional figure.

3,650,442
DISPLAY HOLDER FOR UNPACKAGED TEXTILE ITEMS

Peter M. Berns, Wilmette, and Ely Simonoff, Northfield, both of Ill., assignors to Opelike Manufacturing Corporation, Chicago, Ill.

Filed Apr. 8, 1970, Ser. No. 26,634
Int. Cl. A47j *51/08*
U.S. Cl. 223—87 6 Claims



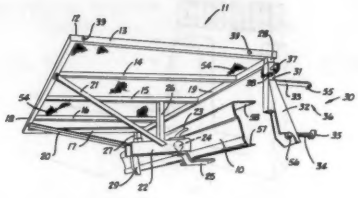
A display support for a textile product wherein the textile item passes through a die cut and slot arrangement in a thinly constructed header which supports the stem and acts as a hanger. The die cut slot provides a passage for attaching the textile product to the support, and flaps formed by the die cut bend inward and add further support and stability for the textile product.

3,650,443
CARRIER CONNECTABLE TO AUTOMOBILE BUMPER AND TRAILER HITCH

Harlan G. Haskett, 5050 West 11th St., Indianapolis, Ind., and Timothy B. Willoughby, 5811 Bar Dell, Indianapolis, Ind.

Filed Nov. 23, 1970, Ser. No. 91,882
Int. Cl. B60r *9/06*
U.S. Cl. 224—42.03 A 6 Claims

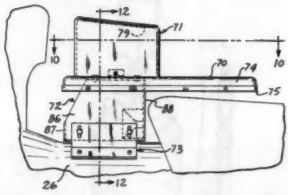
A wheelless carrier connectable to an automobile bumper and trailer hitch. A rectangular grid frame having a mesh screen fixed to its top surface is positioned above and extends out from the automobile bumper. A pair of bumper mounts mounted to the bumper are positioned on either side of a trailer hitch extending out beneath the bumper. Legs fixedly attached to the frame are lockingly received by the bumper mounts. A pair of cross struts have top ends fixed to the outer edge of the frame and extend downward and inward in a general V-shape having lower ends connected to a trailer hitch receiving device. A vertical member connected to the underside of the frame is fixedly mounted atop the trailer hitch receiving device. An animal house having air vents and a hinged door is removably mounted atop the frame.



3,650,444
COMMUNICATIONS EQUIPMENT MOUNTING ASSEMBLY

Elmer B. Gibson, Northbrook, and Eric K. Stark, Palatine, both of Ill., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 10, 1970, Ser. No. 18,147
Int. Cl. B60r *11/02*
U.S. Cl. 224—42.42 R 4 Claims



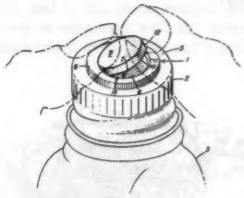
There is disclosed a mounting assembly for mounting teleprinter equipment and communications control equipment such as radio, selective call, and siren controls. The mounting assembly, which can be secured to the floor of a vehicle such as an automobile, has support means in the form of a shelf which extends into overlying relationship with respect to seat structure. In one embodiment of the invention, the mounting assembly is provided mainly by a contoured plastic shell constructed of two plastic shell sections, and in another embodiment of the invention the mounting assembly is provided by a plate-like member and upper and lower sections secured to opposite sides of the plate-like member, the lower section being secured to the vehicle floor.

3,650,445

MEDICINAL TABLET BREAKER

Charles J. Heitzman, Honolulu, Hawaii, assignor to Wilmer Mechlin, Chevy Chase, Md., a part interest

Filed Sept. 19, 1969, Ser. No. 859,377
Int. Cl. B26f *3/02*
U.S. Cl. 225—93 8 Claims



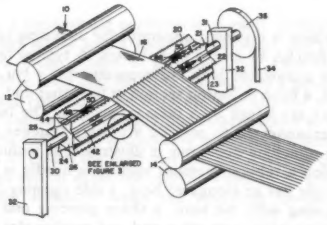
A device readily formable in a bottle cap for breaking medicinal tablets into parts suitable for reduced dosages.

3,650,446

BEATER BAR WITH DISSIMILAR EDGES

Stanley D. Samluk, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 3, 1970, Ser. No. 60,682
Int. Cl. B26f *1/20*
U.S. Cl. 225—97 5 Claims



A rotatable beater bar, used for fibrillating film, comprises dissimilar serrated edges mounted thereon for improving fibrillating efficiency.

3,650,447

LOOP CONTROL DEVICE

Edward Muka, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1970, Ser. No. 38,716
Int. Cl. B65h *23/18*
U.S. Cl. 226—34 8 Claims

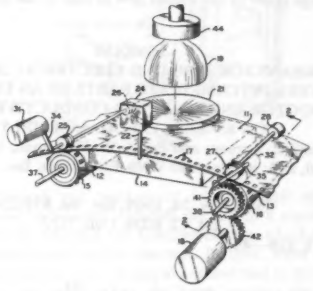
A drive system that normally moves a web of material at a generally constant linear speed includes a device for controlling the size of a loop formed by the web as it is moved through a preselected path. The sensing orifice of a flapper amplifier is positioned relative to the loop and in a preset spaced relation to a surface of the web. Any change in this spaced relation due to a change in the loop size causes the bellows of the amplifier, through an appropriate linkage, to exert a force on a drive control roller having a variable effective diameter. As the roller diameter changes, the linear speed of the web changes and the normal linear speed is attained when the preset spaced relation between the web and sensing orifice is restored.

3,650,448

FILM TRANSPORT AND FILM POSITIONING DEVICE

Howard I. Jarmy, San Francisco, Calif., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Original application Sept. 16, 1966, Ser. No. 580,336, now Patent No. 3,531,591. Divided and this application June 4, 1970, Ser. No. 57,407
Int. Cl. G03b *1/24*
U.S. Cl. 226—45 4 Claims



The disclosed embodiment of the present invention is a film transport which includes a pair of capstan rollers for translating the film, a pair of sprockets associated with the capstan rollers for edge guiding the film, and a curved platen for supporting the film at a flying spot scanner station. An encoder is connected to one sprocket for sensing longitudinal movement of the film and a finger engages and senses the position of an edge of the film. A signal corresponding to the position of the edge of the film is supplied to the deflection circuitry of the flying spot scanner to alter to raster position thereof accordingly.

3,650,449

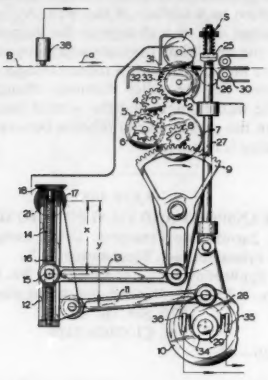
INTERMITTENT FEEDING APPARATUS FOR A WEB OF PAPER OR PLASTICS MATERIAL

Friedhelm Mundus, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Jan. 27, 1970, Ser. No. 6,152
Claims priority, application Germany, Feb. 4, 1969, P 19 05 454.7
Int. Cl. B65h *17/22*
U.S. Cl. 226—142 1 Claim

Apparatus for intermittently feeding a web of material, comprising a pair of feed rollers, intermittent rotating means for the feed rollers including a reciprocatable rack coupled to the feed rollers by transmission gears and a clutch, and means for reciprocating the rack, said reciprocating means comprising a reciprocating drive for rocking a rocker arm about a pivot of fixed location by means of a first link hinged

to the rocker arm, a second link hinged to the rocker arm and to the rack, and adjusting means on the rocker arm for



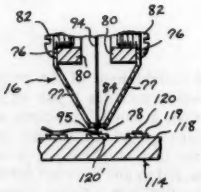
altering the spacing between the pivot of the rocker arm and the hinge point to the rocker arm of one of the links.

3,650,450

MEANS FOR FORMING ELECTRICAL JOINTS BETWEEN INTERMEDIATE PARTS OF AN ELONGATED CONDUCTOR AND SELECTED CONDUCTIVE ELEMENT ON AN ELECTRICAL ASSEMBLY

Raymond B. Larson, and Frank W. Wogoman, both of South Bend, Ind., assignors to Wells Electronics, Inc., South Bend, Ind.

Filed Nov. 24, 1969, Ser. No. 879,234
Int. Cl. B23k *1/00, 5/22*
U.S. Cl. 228—46 **5 Claims**



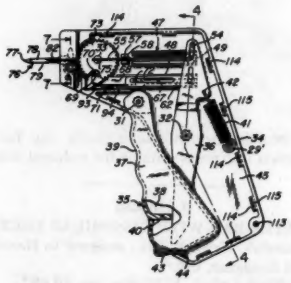
A method and means for forming electrical joints between intermediate parts of an elongated conductor and selected conductive elements on an electrical assembly. The electrical assembly is mounted upon a shiftable support means. A shiftable soldering assembly is positioned above the support means and carries an intermediate part of the elongated conductor. The soldering assembly and support means are shifted relative to each other to cause the intermediate conductor part to be held against a selected conductive element. The intermediate conductor part is then heated to cause the stripping or melting of the insulation, if any, from the conductor part and the melting of the solder on the conductive element in contact with the conductor part. The conductor part is then cooled to permit the melted solder to adheringly solidify to the conductor part. With the conductor part so anchored to the electrical assembly the soldering assembly and support means are shifted relative to each other to cause another intermediate part of the conductor to be held against another selected conductive element. This last mentioned intermediate conductor part is heated and cooled to cause its adherence to the contacting conductive element in the manner previously described for heating and cooling the first mentioned intermediate conductor part.

3,650,451

TAG ATTACHER

Norman R. Weiland, Englewood, and Eugene W. Finke, Miamisburg, both of Ohio, assignors to The Monarch Marking System Company, Dayton, Ohio

Filed Sept. 30, 1970, Ser. No. 76,840
Int. Cl. B26f *1/32*
U.S. Cl. 227—67 **10 Claims**



There is disclosed apparatus for attaching tags to a variety of articles by means of fasteners. A typical fastener useable in a connection with the apparatus has a bar section at one end, a head or button section at the other end, and these sections are joined by a filament section. The fasteners can be interconnected to provide a unitary fastener assembly. The tag attaching apparatus is illustrated as including a body in which a tubular member such as a needle is mounted. The needle has an elongated bore, a side opening or slot communicating with the bore, a sharp piercing end at one end, a cutting edge at its other end and another slot through which a bar section can enter the bore. The needle has a rack which meshes with a segment of a pinion by which the needle can be driven into or out of the body. The body mounts operating and drive levers, and a one-piece ratchet wheel and feed wheel. A push rod in alignment with the bore is guided for reciprocatable movement in the body and is connected to the drive lever by a pin-and-slot connection. A pawl cooperates with the ratchet wheel and a slide interconnects the pawl with the drive lever. There is a pin-and-slot connection between the drive lever and the slide and there is a pin-and-slot, lost-motion, connection between the slide and the pawl. The slide and the pawl are guided for reciprocatable movement relative to each other and relative to the feed wheel. A spring is used to return the push rod and the levers to their initial positions and to cause the ratchet wheel to be driven to advance the fasteners when the operating handle is released.

3,650,452

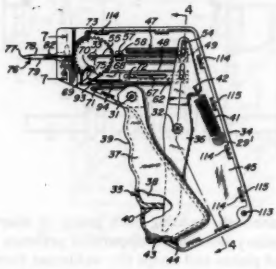
TAG ATTACHER

Eugene W. Finke, Miamisburg, Ohio, assignor to The Monarch Marking System Company, Dayton, Ohio

Filed Sept. 30, 1970, Ser. No. 76,842
Int. Cl. B65c *5/06*
U.S. Cl. 227—67 **16 Claims**

There is disclosed apparatus for attaching tags to a variety of articles by means of fasteners. A typical fastener useable in connection with the apparatus has a bar section at one end, a head or button section at the other end, and these sections are joined by a filament section. The fasteners can be interconnected to provide a unitary fastener assembly. The

tag attaching apparatus is illustrated as including a body in which a tubular member such as a needle is mounted. The needle has an elongated bore, a side opening or slot communicating with the bore, a sharp piercing end at one end, a cutting edge at its other end and another slot through which a bar section can enter the bore. The needle has a rack which meshes with a segment of a pinion by which the needle can be driven into or out of the body. The body mounts operating and drive levers, and a one-piece ratchet wheel and feed wheel. A push rod in alignment with the bore is guided for reciprocatable movement in the body and is connected to the



drive lever by a pin-and-slot connection. A pawl cooperates with the ratchet wheel and a slide interconnects the pawl with the drive lever. There is a pin-and-slot connection between the drive lever and the slide and there is a pin-and-slot, lost-motion, connection between the slide and the pawl. The slide and the pawl are guided for reciprocatable movement relative to each other and relative to the feed wheel. A spring is used to return the push rod and the levers to their initial positions and to cause the ratchet wheel to be driven to advance the fasteners when the operating handle is released.

3,650,453

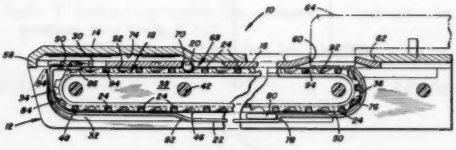
STAPLE CARTRIDGE WITH DRIVE BELT

Forrest P. Smith, Jr., Northport, Long Island, N.Y., assignor to United States Surgical Corporation, Baltimore, Md.

Filed Aug. 13, 1970, Ser. No. 63,584

Int. Cl. B25c *5/02*

U.S. Cl. 227—138 **21 Claims**



A staple-housing cartridge suitable for use in a surgical arena, adapted to be mounted on a powering unit, and suitable for suturing the skin or fascia of a patient. A plurality of staples are guided and are driven by a continuous belt adapted for rotation in the cartridge housing. When the powering unit is activated, a pusher element integral with the cartridge ejects and form a staple and simultaneously advances the continuous belt, with its supply of staples, to ready the cartridge for the next stapling operation.

ERRATUM

For Class 228—1 see:
Patent No. 3,650,450

3,650,454

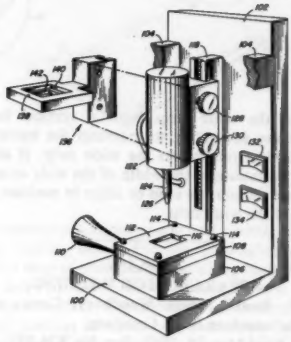
DEVICE FOR BONDING WITH A COMPLIANT MEDIUM

Alexander Coucoulas, Bridgewater Township, Somerset County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Original application July 6, 1967, Ser. No. 651,411, now Patent No. 3,533,155, dated Oct. 13, 1970. Divided and this application Nov. 21, 1969, Ser. No. 877,562

Int. Cl. B23k *1/06*

U.S. Cl. 228—1 **15 Claims**



The bonding of two workpieces by ultrasonic or thermocompression techniques requires the use of a rigid bonding tip or ram to transmit the bonding energy, whether it be vibratory, mechanical and/or thermal. In time, such a rigid medium is subject to wear, to mis-alignment and to pickup of material from the workpieces, the latter causing the upper workpiece to stick to the tip. Further, such a rigid medium cannot be used reliably to make a number of bonds simultaneously, because minor size differences in the workpieces can prevent a good couple for energy transmission from being established to every workpiece. It has been discovered that a compliant or deformable medium can be employed to hold the workpieces during bonding. By deforming around the workpieces, the compliant medium eliminates the problem of size differences, as well as wear, mis-alignment and the like, and a good bond is achieved in each instance. In one aspect, the bonding energy is transmitted through the compliant medium to make the bond. In a second aspect, the bonding energy is transmitted through the support for the workpieces. The quality of individual bonds is improved because, for a given set of bonding conditions, there is less deformation of the workpieces than with conventional techniques. The invention is particularly applicable to the bonding of beam-lead transistors and integrated circuits to substrates, to bonding a plurality of leads to integrated circuit and thin film devices, and to bonding brittle single crystal chips to substrates.

3,650,455

STRIP GUIDE

Carlton G. Rutter, Seekonk, and Joseph R. Malone, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

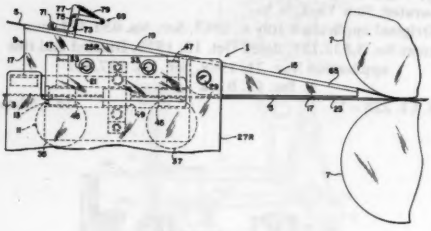
Filed July 17, 1970, Ser. No. 59,774

Int. Cl. B23k *1/00*

U.S. Cl. 228—6 **8 Claims**

A guidance system for guiding a relatively wide metal strip and one or more relatively narrow metal strips to be roll

bonded as they travel to the bonding rolls for accurately laying the narrow strip or strips on the wide strip. It comprises a carriage mounted for lateral sliding movement relative to the path of the strips, the wide strip and the narrow strip or strips being guided through the carriage for travel to the bonding rolls. The carriage is movable laterally in response to lateral



deviation of the wide strip from a vertical longitudinal reference plane accurately to maintain the narrow strip or strips in position relative to the wide strip. It also acts in response to variations in the width of the wide strip accurately to maintain the narrow strip or strips in position relative to a side edge of the wide strip.

3,650,456

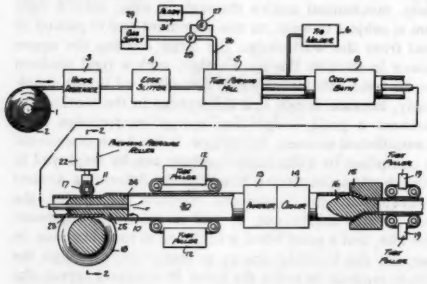
APPARATUS FOR WELDING

Douglas W. Rowell, North Woodbury, Conn., assignor to Anaconda American Brass Company

Filed May 20, 1969, Ser. No. 826,198

Int. Cl. B23k *1/00, 5/22*

U.S. Cl. 228—19 **12 Claims**



A method and apparatus for the continuous production of welded tube from a continuous length of strip material wherein the welded seam is cold worked and wherein the physical nature of the welded seam is continuously monitored to insure that a proper weld is produced is described herein.

3,650,457

PANEL FITTING AND WELDING MACHINE

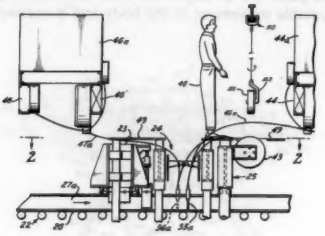
Harry J. Fiegel, Jr.; Russell S. Thatcher, and Richard L. Linam, all of Galveston, Tex., assignors to Kelso Marine, Inc.

Filed Jan. 28, 1969, Ser. No. 794,615

Int. Cl. B23k *19/00*

U.S. Cl. 228—44 **16 Claims**

A machine for manufacturing reinforced structural panels wherein a conveyor system moves successive loads, each comprising a group of structural shapes and a structural plate, past cooperating positioning and hold-down apparatus, welding apparatus and secondary hold-down apparatus. The positioning and hold-down apparatus maintains the shapes in a desired upright position with a desired spacing between shapes and holds the shapes tightly against the plate. The welding apparatus includes a series of side-by-side welding



units for simultaneously welding each group of shapes to its plate. The secondary hold-down apparatus prevents warping of the shapes and plates and keeps the weldment from raising off of the conveyor because of heat distortion during the welding operations.

3,650,458

OPENING ARRANGEMENT ON PACKAGES

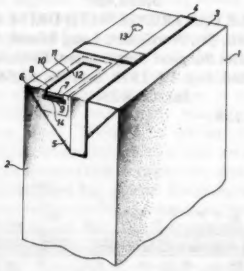
Hans Anders Rausing, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Oct. 20, 1970, Ser. No. 82,346

Claims priority, application Sweden, Oct. 20, 1969, 14.336/69

Int. Cl. B65d *5/72*

U.S. Cl. 229—17 **10 Claims**



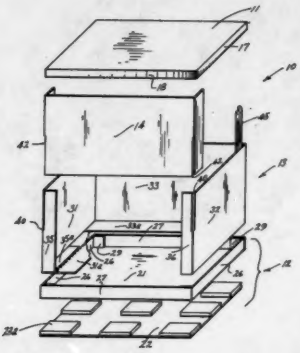
The invention relates to an opening arrangement on a package consisting of a tube sealed at its ends and preferably of parallelepiped shape with double-walled triangular flaps which project from the ends of the package and are folded in against its walls, one of the flaps forming part of an opening arrangement and exhibiting a sealing strip which extends onto the top end wall of the package and which is intended to cover a discharge opening. The discharge opening is a slot formed in the upper end wall of the package which slots extends beyond the end edge of the package which adjoins the said flap, and provides a pouring edge which is constituted by an edge of the package.

3,650,459

PALLET TYPE SHIPPING CONTAINER

Roger A. Tucker, Blue Island, Ill., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 11, 1969, Ser. No. 884,233
Int. Cl. B65d *13/04, 19/20, 85/64*
U.S. Cl. 229—23 A 2 Claims



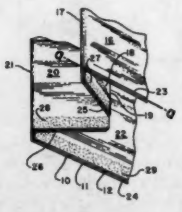
A pallet type light weight container for maximized utilization of available cargo space in freighter aircraft or other carriers includes provision for ease in loading and/or unloading of articles into and/or from the container with the front and top thereof open. The container requires on other fastening means except for customary tapes which are tightened and secured around the container after it has been erected and filled with articles to be shipped. The container can be shipped and/or stored in knocked-down form for assembly by the user and comprises essentially flat basic elements formed from flat sheets or blanks of material such as corrugated paper board or the like which are bent to form, respectively, bottom and top portions, a body portion, and a front panel readily detachably securable to the body portion. The container includes the provision of resilient elements in the bottom portion, and optionally at the corners of the container, for protectively cushioning articles within the container against impact loads and/or against compressive stresses to which the container may be subjected in connection with its shipment, handling, and/or storage.

3,650,460

PAPER BAG

Burke P. Lokey, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 13, 1962, Ser. No. 216,388
Int. Cl. B65d *31/02*
U.S. Cl. 229—55 2 Claims



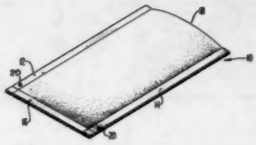
A gusseted, multi-ply bag having a rear surface and gusset portions adhered to a front surface of the bag to form an end closure and a longitudinal seam formed by the longitudinal edges of each ply being bonded together in overlapped relation.

3,650,461

EASY OPEN POUCH CONSTRUCTION

James L. Hutcheson, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 16, 1970, Ser. No. 11,459
Int. Cl. B65d *31/02, 5/54*
U.S. Cl. 229—66 2 Claims



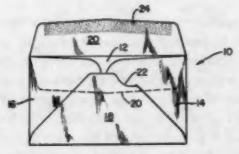
An easy open pouch construction and a method of and apparatus for making same. Flexible packaging material is formed into a strip of pouches joined along their longitudinal side seams and fed intermittently through guide means adjacent a reciprocable hole puncher. The feeding means includes means such as an electric eye assembly for detecting the mid-point of the longitudinal side seam between adjacent pouches whereby the reciprocable hole puncher is actuated to punch a hole spaced a slight distance from the mid-point of the longitudinal seam. The strip of pouches is then cut to form an individual pouch which is filled conventionally. The resultant pouch is found to have improved easy opening characteristics.

3,650,462

NOTCHED FLAP ENVELOPE

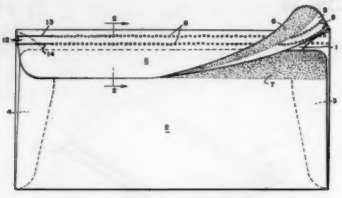
Richard S. Klover, Portland, Oreg., assignor to Pak-Well Corporation, Denver, Colo.

Filed Oct. 27, 1969, Ser. No. 869,637
Int. Cl. B65d *27/00*
U.S. Cl. 229—68 R 4 Claims



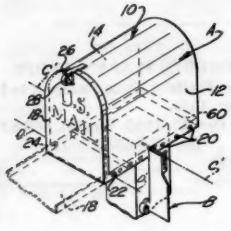
A paper envelope of conventional form comprising a rectangular front face, inwardly folded end flaps, an upwardly folded bottom flap, and a downwardly folded top or closure flap, characterized by a cutout portion in one of the flaps, preferably the bottom flap, which provides a printing area on the front face which is of uniform three thicknesses of paper throughout such area and permits printing of a return address in such area without resort to the make-ready printing procedure.

3,650,463
SELF-CONTAINED ENVELOPE OPENING STRIP
Deryl R. Christiansen, Salem, Oreg., and Jack R. Christiansen, 1081 D. River Road, Sweet Home, Oreg., assignors to said J. R. Christiansen, by said D. R. Christiansen
Filed Feb. 18, 1970, Ser. No. 12,261
Int. Cl. B65d *27/34*
U.S. Cl. 229—81 1 Claim



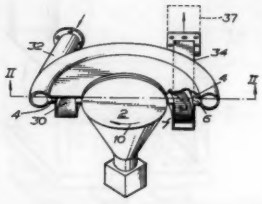
A mailing envelope having self-contained opening means comprising at least one row of perforations extending through the front face, the end flaps and the closure flap. The perforations extend along the top marginal edge of the envelope closely adjacent the fold line which forms the closure flap, and terminate in a pull tab formed along a line cut inwardly from one end of the envelope.

3,650,464
DOOR OPERATED SIGNAL FOR MAILBOXES
John William Lewis, 17228 Shumer Road, Strongsville, Ohio
Filed Mar. 30, 1970, Ser. No. 23,731
Int. Cl. B65d *91/00*
U.S. Cl. 232—35 2 Claims



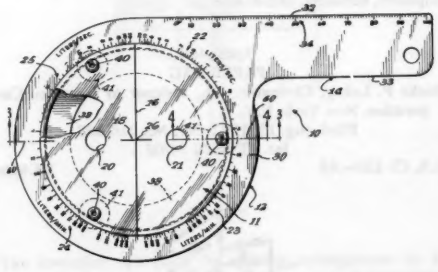
A door operated delivery signal is disclosed for a mailbox which has an opening at one end, and a door pivotally mounted at substantially its lower edge to the lower portion of the box for pivotal movement between a door open position and a door closed position for covering the opening. The signal includes an elongated member which is adapted to be pivotally secured to one side of the box for pivotal movement about a horizontal axis located rearwardly of the opening, and extending parallel to the door axis between a substantially horizontal latched position where the member extends longitudinally alongside one side of the box from its pivot axis toward the opening, and a downwardly directed substantially vertical unlatched position for signaling mail delivery. A resilient curved member extends from the elongated member in such a manner that in the latched position a curved surface of the resilient member bears against the forwardly facing surface of the door to latch the signal in place. The door cams against the curved surface as it is being opened and the signal is pivotally displaced to its unlatched position.

3,650,465
DISCHARGE OF SOLID PARTICLES FROM CENTRIFUGAL MACHINES
Geoffrey L. Grimwood, Holmfirth, and Duncan C. Ferrier, Tiverton, both of England, assignors to Thomas Broadbent & Sons Limited, Huddersfield, Yorkshire, England
Filed Nov. 13, 1969, Ser. No. 876,229
Claims priority, application Great Britain, Nov. 16, 1968, 54,475/68
Int. Cl. B04b *15/08*
U.S. Cl. 233—13 22 Claims



A method and apparatus for modifying the flight of particles discharged from the lip of the basket of a centrifugal machine. A pneumatic zone is created around the lip of the basket, and a series of gaseous jets are directed into this zone so as at least to reduce the radial component of velocity, considered in a direction radially outwardly of the basket, of particles discharged from the basket lip. The particles may be allowed to fall, under the influence of gravity, from the pneumatic zone, or alternatively may be pneumatically conveyed from the centrifugal machine.

3,650,466
SLOPE CALCULATOR
Daniel A. Talonn, University City, Mo., assignor to Sherwood Medical Industries Inc.
Filed Aug. 8, 1969, Ser. No. 849,608
Int. Cl. B43i *7/00, 13/00*
U.S. Cl. 235—61 B 11 Claims



A manually operable computer for slope calculations and in particular for calculating air flow rates from a patient's spirogram including a circular indicating disc with a diametral line thereon positionable coincident to the slope of the spirogram tracing to be measured and a scale member with an annular portion surrounding and pivotally mounted with respect to the circular disc, there being provided a projection from the annular portion that is adapted to be aligned

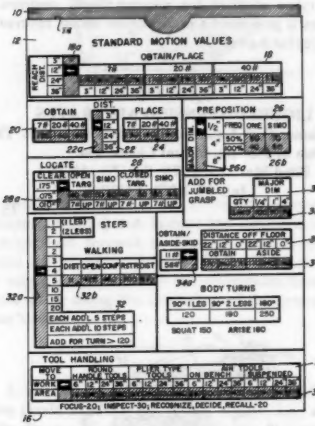
with one of the coordinates of the spirogram after the circular disc line is positioned, there being also provided cooperating indicator and scales on the members that give a direct visual readout of the patient's respired air flow rate in volume per unit time.

3,650,467

TIME-MOTION CALCULATOR

Clifford Sellie, Northbrook, Ill., assignor to International Standards Incorporated S.A.

Filed Sept. 17, 1970, Ser. No. 73,031
Int. Cl. G06c 3/00
U.S. Cl. 235—89 R 5 Claims



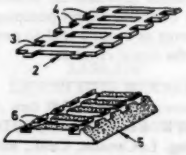
Times required to perform various work tasks are obtained quickly and easily by reading a printed card which slides within an open-ended envelope having windows at particular locations.

3,650,468

TRACK ASSEMBLY FOR TOY AND MODEL RAILROADS

Gerhard Ewe; Hugo Dennerlein; Heinrich Schmidt, all of Nurnberg; Horst Hirschmeier, Heilsbronn, and Willi Fechter, Nurnberg, all of Germany, assignors to Gebr. Fleischmann, Nurnberg, Germany

Filed July 24, 1969, Ser. No. 844,256
Claims priority, application Germany, Aug. 10, 1968, G 67 50 358; Nov. 15, 1968, G 68 07 028; Jan. 24, 1969, G69 02 692.2
Int. Cl. A63h 19/30
U.S. Cl. 238—10 E 10 Claims



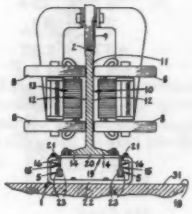
A track assembly for toy and model railroads comprises a tie assembly and a ballast bed assembly separately produced by injection molding and fixedly joined by gluing, heat sealing or other suitable means. The rails are secured to the upper side of the tie assembly by formfitting engagement at the foot of each rail with grooves in the tie assembly.

3,650,469

LINEAR MOTOR REACTION RAIL ASSEMBLY

Brian John Nicholson, Milton, England, assignor to Tracked Hovercraft Limited, London, England

Filed Feb. 20, 1970, Ser. No. 12,996
Claims priority, application Great Britain, Feb. 21, 1969, 9,536/69; May 5, 1969, 22, 900/69
Int. Cl. E01b 9/30
U.S. Cl. 238—264 11 Claims



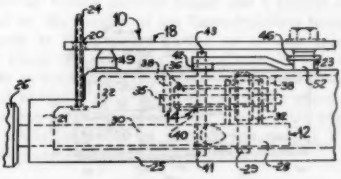
A mounting for attaching to a prepared track a reaction plate for cooperation with a double-sided linear induction motor stator carried by a vehicle arranged for operation along the track whereby to propel the vehicle. The mounting has two spring arrangements which are disposed one to either side of the reaction plate and each of which comprises first and second leaf spring means each comprising a leaf spring which lies in a plane parallel to the plate. In each spring arrangement the leaf springs of the two leaf spring means extend in the same direction to a mutual connection. The mounting is such that a side force on the plate causes the plate to undergo lateral movement with little or no other movement, rotational or translateral.

3,650,470

LIQUID SPRINKLING SYSTEM

Charles A. Wertman, 14266 Young, Detroit, Mich.

Filed Jan. 28, 1971, Ser. No. 110,545
Int. Cl. B05b 17/00
U.S. Cl. 239—1 6 Claims



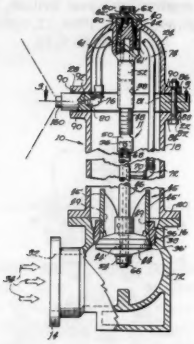
Improvements in liquid sprinkling systems are disclosed including means and method comprising passing liquid through a plurality of flexible tubings and for cyclicly moving said tubings in unison while liquid is passing therethrough to produce a predetermined liquid sprinkling pattern formed by continually moving liquid streams which evenly distribute the liquid thereover.

3,650,471

FIRE HYDRANT SPRAY DEVICE

Raymond Sutton, 1104 Crest Lane, Western Springs, Ill.

Filed Jan. 22, 1971, Ser. No. 108,930
Int. Cl. A01g *27/00*
U.S. Cl. 239—67 **15 Claims**



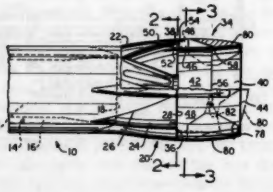
A recreational spray device is adapted to be installed on a conventional fire hydrant and comprises spray passage means and a spray valve. The spray passage means is connected at one end to the hydrant inlet and has a spray head at its other end. The spray passage means is arranged so that the spray device is operable even though the main hydrant valve is closed. The spray valve controls the flow in the spray passage means and is normally closed, but the spray valve may be manually opened and will automatically close after a period of time. Thus, the spray device uses only a small amount of water and prevents an excessive pressure drop in the hydrant water system.

3,650,472

THRUST CONTROL AND SOUND SUPPRESSION APPARATUS

Remo Tontini, San Diego, and Raymond K. Johnsen, La Jolla, both of Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Oct. 16, 1970, Ser. No. 81,263
Int. Cl. B64d *33/06*
U.S. Cl. 239—265.13 **11 Claims**



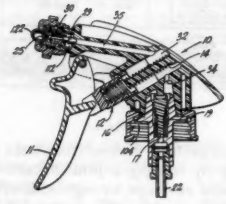
Engine of either turbo fan or turbojet type is provided with multiple lobed exhaust nozzle. An ejector barrel defining a mixing zone is adapted to be connected at its leading edge to the lobe tips adjacent to the nozzle exit plane to receive engine gases and free stream air. A plenum chamber in the forward portion of the barrel has inlet ports in flow communication with tip portions of lobes, and guide vanes extend forward into lobes to split the mixed engine gases and guide outer streams into plenum chamber inlet ports while inner streams flow directly to mixing zone. An annular control nozzle at aft end of plenum chamber discharges high pressure gases into intermediate section of mixing zone to form a gaseous ring surrounding the other gases. The high velocity flow at inner wall increases total flow and makes velocity profile more uniform, and further mixing with adjacent gases reduced sound level. Design of control nozzle determines profile of gaseous ring which becomes virtual aerodynamic profile of aft portion of ejector barrel, which may be convergent-divergent nozzle shape for optimum cruise conditions of a high subsonic aircraft. Nozzle may also be adjustable to produce varying profiles for varying flight regimes. Basic design makes it possible to incorporate thrust reverser in aft portion of ejector barrel.

3,650,473

LIQUID DISPENSING APPARATUS

Carl E. Malone, Fort Lauderdale, Fla., assignor to The AFA Corporation of Florida, Miami Lakes, Fla.

Filed Mar. 13, 1970, Ser. No. 19,401
Int. Cl. B05b *11/00*
U.S. Cl. 239—333 **15 Claims**



A combined closure and liquid pumping device for a container having a cap adapted to screw onto a threaded spout of the container. The closure also includes a pump mechanism having a liquid ejection nozzle orifice connected by a liquid conduit to an inlet within the container. The pump has inlet and outlet check valves in the conduit and a pump chamber connected to the conduit between the valves. The outlet valve is spaced from the orifice and is lightly biased to closed position thus to define an air chamber between the outlet valve and the orifice. An openable seal blocks communication between the orifice and the exterior of the closure for disabling liquid pumping operation of the pump and also serves as a static seal to prevent leakage from the container via the liquid conduit.

3,650,474

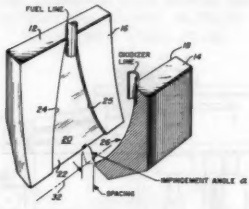
BIPROPELLANT INJECTOR

Robert W. Riebling, LaCanada, Calif., assignor to James E. Webb, Administrator of the National Aeronautics and Space Administration

Filed Sept. 25, 1967, Ser. No. 670,829
Int. Cl. F23d *11/10*
U.S. Cl. 239—418 **8 Claims**

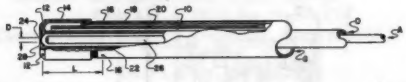
A bipropellant injector consisting of a pair of concave deflector blocks with their concave surfaces facing one

another. The concave surfaces diverge downwardly with a fixed spaced relationship between them at the base of the injector. A triangular "shute" is formed in each concave surface, by a pair of diverging sidewalls. The two shutes are opposite one another. A circular orifice is located at the apex of each shute to provide an inlet for propellant, such as fuel or oxidizer to enter the injector. Propellant, forced through



each orifice as a circular jet, is directed downwardly along the shute spreading out against the concave shute surface. The propellant spreads to form a sheet which is limited between the shute's sidewalls. It finally clears the shute's lower edge, and mixes with the propellant flowing from the opposite shute along the centerline of the space between the injector's blocks.

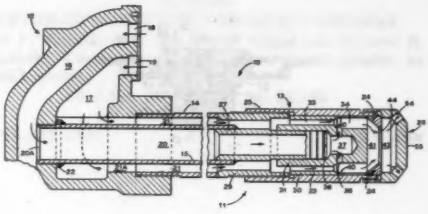
3,650,475
CARBON BLACK BURNER CONSTRUCTION
Charles David Stubblefield, Baton Rouge, La., and John Lee Wells, Borger, Tex., assignors to J. M. Huber Corporation, Borger, Tex.
Filed Jan. 7, 1970, Ser. No. 1,092
Int. Cl. F23d *11/16*
U.S. Cl. 239—419.3 **4 Claims**



An improved carbon black burner construction utilizing multiple arrays of gas jets spaced from the oil discharge orifice and including a venturi atomizing tip just prior to the oil discharge orifice improves the light transmittance of a benzene extract from nonstaining large particle size, high structure carcass carbon blacks.

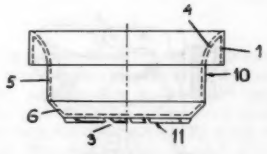
3,650,476
LIQUID FUEL BURNER
John M. Rackley, and Ralph H. Merryman, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed Jan. 16, 1968, Ser. No. 698,332
Int. Cl. A62c *31/00*
U.S. Cl. 239—431 **2 Claims**

A liquid fuel burner equipped with an improved atomizer head wherein the liquid fuel is mixed with an atomizing fluid to be discharged as a finely atomized spray. Improvements to the atomizer head include a mixing portion, a flow-diverting portion and a spraying portion serially arranged to provide three stages of atomization. The first stage occurs as the fuel stream is sheared by high velocity steam in the mixing por-



tion, the second stage is the impingement and re-directing of the mixture discharging from the mixing portion into the flow-diverting portion and the third stage takes place as the fluid mixture is expanded through the discharge ports of the spraying portion.

3,650,477
CHOKE
Karl Ivar Ake Gullikkson, Norrkoping, Sweden, assignor to Sovereign Finanz A.G., Zurich, Switzerland
Filed Nov. 2, 1970, Ser. No. 86,086
Claims priority, application Sweden, Nov. 4, 1969, 15076/69
Int. Cl. B05b *1/35*
U.S. Cl. 239—490 **9 Claims**

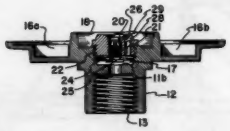


A choke for the burner head in an oil-fired unit, comprising a cylindrical support adapted to fit over the orifice of an air-supply pipe, a flame-stabilizer funnel extending from the external rim of said support obliquely inwards, which stabilizer funnel, at its internal end, supports a turbulence-producing device having inclined blades and a central opening for an oil jet, the portion of the flame-stabilizer funnel which is adjacent to the support having an arcuate cross-sectional form whose tangent at the point of contact with the support makes an acute angle with said support, the flame-stabilizer funnel having a series of openings axially spaced from the turbulence-producing device and whose inner edges are offset radially outwards so that air jets passing through the openings are directed obliquely inwards.

3,650,478
ARCUATE SPRINKLER
Adrian L. Jones, 73 West Truman Ave., Salt Lake City, Utah
Filed Jan. 21, 1971, Ser. No. 108,341
Int. Cl. B05b *1/26*
U.S. Cl. 239—516 **10 Claims**

A sprinkler having a body with an outwardly extending flange and an upstanding ring which acts as guard for a noz-

zle. The nozzle has an orifice arranged to spray a pattern of water over a segmented area. A deflector wire is mounted on the nozzle, adjacent to and above the orifice where it will deflect a part of the water passing through the orifice upwardly and outwardly from the nozzle so as to effectively distribute water to points closely adjacent to the sprinkler head itself, thereby eliminating the need for excessive pattern overlap in sprinkler distribution systems.



3,650,479

SPRAY GUN WITH HANDLE MEANS

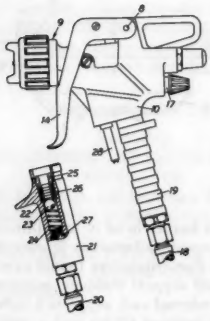
Kurt Herman Liedberg, Skara, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 26, 1970, Ser. No. 83,950

Claims priority, application Sweden, Oct. 31, 1969, 14951/69

Int. Cl. B05b *7/02*

U.S. Cl. 239—527 **8 Claims**



A spray gun has longitudinally divided or bisected handle means one-half of which provides a fixed hand grip portion on the spray gun body while the other half is a separable hand grip portion fixedly connected to the fluid supply hose of the spray gun. The separable hand grip portion is a female coupling member which incorporates a self closing discharge valve and is quickly attachable and detachable respectively to and from a male coupling member. The latter is disposed adjacent the fixed hand grip portion on the gun body and adapted to open the discharge valve and to receive fluid from the hose when the female coupling member is attached thereto to form together with the fixed hand grip portion of a complete handle means for the spray gun.

3,650,480

METHOD AND AN APPARATUS FOR PRODUCING WOOD WOOL

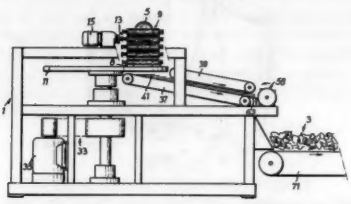
Gerrit Jan Van Elten, Voorthuizen, Netherlands, assignor to Thermoform, A.G., Fribourg, Switzerland

Filed Apr. 27, 1970, Ser. No. 32,025

Claims priority, application Germany, Apr. 29, 1969, P 19 21 867.8

Int. Cl. B27c *11/00*

U.S. Cl. 241—28 **16 Claims**



Thin sheets are sliced from a block of wood by means of a continually moving planing tool. As each sheet is separated from the block it is deposited on a slowly moving conveyor. On this conveyor the sheets are superimposed in staggered relationship like fish scales and form a steady stream conveyed to a wool cutting station where a cutter cuts the wood wool from the superimposed sheets transversely thereto.

3,650,481

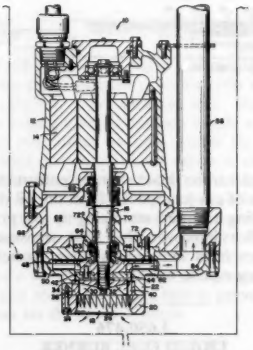
GRINDER PUMP

William J. Conery, and Donald A. Kaessen, both of Ashland, Ohio, assignors to Hydr-O-Matic Pump Company, Hayesville, Ohio

Filed Apr. 1, 1971, Ser. No. 130,276

Int. Cl. B02c *18/40*

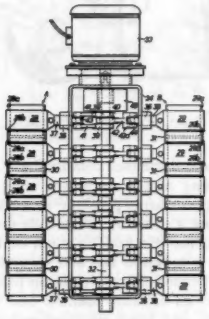
U.S. Cl. 241—46.11 **11 Claims**



The grinder pump includes an electric motor drive, cooperating cutter blade and grinder members one of which is secured to the motor shaft at an inlet for the grinder pump unit, an axial flow inducer impeller axially inwardly of and immediately adjacent to the cooperating cutter blade and grinder members, and a centrifugal pump means having an

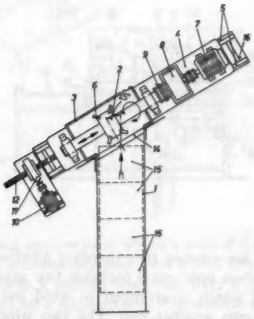
inlet directly connecting to and receiving the discharge from the axial flow inducer impeller, all of the driven members being controlled by and carried on the shaft of the electric motor.

3,650,482
MATERIAL-TREATMENT MACHINES
Robin Desmond Radcliffe Andrews, "Green Acre," Daisy Bank Road, Leckhampton, Cheltenham, England
Filed Jan. 26, 1970, Ser. No. 5,871
Claims priority, application Great Britain, Jan. 30, 1969, 5,533/69; Mar. 29, 1969, 16,576/69
Int. Cl. B02c *17/06, 17/14*
U.S. Cl. 241—153 **10 Claims**



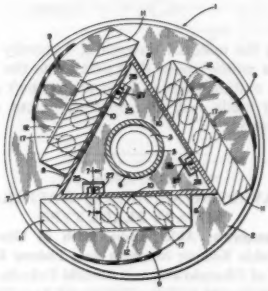
A machine for the treatment of material, for example for the size reduction of solid materials, comprises carrier means for supporting the material and means for suspending and positively driving the carrier means so as to vibrate the latter at a fixed amplitude and frequency. A plurality of the carrier means is provided, suspended and positively driven in such manner that the two or more carrier means and driving means are inherently balanced.

3,650,483
SCRAP MILL
Helmut Galter, Kassel, Germany, assignor to Rheinstahl Henschel Aktiengesellschaft, Kassel, Germany
Filed Apr. 6, 1970, Ser. No. 26,073
Claims priority, application Germany, Apr. 10, 1969, P 19 18 123.8
Int. Cl. B02c *13/02, 13/286*
U.S. Cl. 241—186 R **5 Claims**



A scrap mill for crushing pre-pressed scrap packets to form smaller scrap pieces for further processing, in which the respective scrap packet to be crushed is fed toward the beater or crusher drum at an angle of approximately 45° with regard to the axis of rotation of said beater or crusher drum while said drum is reciprocable in the direction of its axis of rotation selectively toward and away from the scrap packet to be crushed.

3,650,484
ROTOR CONSTRUCTION FOR IMPACT CRUSHER
Floyd E. Kimble, R.D. #1, Dover, Ohio, and Richard H. Buchsieb, Cambridge, Ohio, assignors to said Kimble, by said Buchsieb
Filed Apr. 3, 1970, Ser. No. 25,354
Int. Cl. B02c *13/06, 13/28*
U.S. Cl. 241—192 **11 Claims**

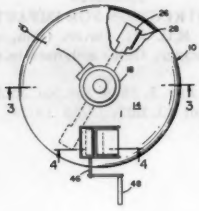


A rotor for an impact crusher in which the hammers comprise breaker bars disposed tangentially to a common circle, with means for adjusting the breaker bars tangentially to compensate for wear. The rotor Comprises a tubular member having at least three flat sides of uniform width, with an end disc welded or otherwise secured to each end thereof. A preferably half-moon shaped block is secured to the inner face of each end disc with the flat faces thereof spaced from and parallel with each flat face of said tubular member. This forms grooves within which the ends of the breaker bars are adjustably mounted. Slots of greater widths than the breaker bars are formed in the discs intermediate the flat faces of the tubular member and the flat faces of the corresponding half-moon shaped members. An adjusting block is slidably mounted in each slot and has a trunnion on its inner side received in an aperture in the adjacent end of the corresponding breaker bar. As an alternative, the apertures may extend entirely through the breaker bars, and shear rods may be located therethrough and in openings in the adjusting blocks. Removable shims may be secured in each slot on each side of the corresponding adjusting block. Wedges are inserted in pockets in the tubular member for forcing the breaker bar against the half-moon blocks.

3,650,485
CHOPPING DEVICE
George K. Brokaw, 110 Forest Ln., Berkeley, Calif.
Filed Feb. 17, 1970, Ser. No. 12,010
Int. Cl. B02c *18/10*
U.S. Cl. 241—245 **10 Claims**

A device for chopping or cutting up brush garden trimmings and other waste material to a size suitable for use

as a mulch or compost comprises a mounting plate with edge means for securing it like a removable cover on a container. An opening on one side of the plate is spaced radially from its center and feed means are provided around the opening



for directing the material through it. Centrally mounted on the plate is a motor whose shaft extends to the underside of the plate. A cutting blade is fixed to the shaft and operates with a fixed blade near the opening to cut up materials forced through it.

3,650,486

YARN TRAVERSING METHOD AND APPARATUS OF A ROTARY BLADE TYPE

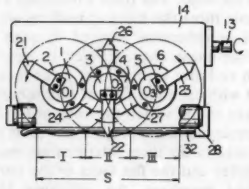
Katsumi Hasegawa; Akio Ando, both of Otsu-shi; Morio Okada; Yukio Kohno; Norihiro Aoi; Tadasu Kamo; Shiniti Hikita, all of Okazaki-shi, and Atsushi Fukuda, Otsu-shi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 19, 1969, Ser. No. 825,903

Claims priority, application Japan, May 20, 1968, 43/33914; Feb. 27, 1969, 44/14907; Mar. 10, 1969, 44/18116; 44/18117

Int. Cl. B65h *54/28*

U.S. Cl. 242—43 **12 Claims**



A yarn traversing system of a rotary blades type is disclosed wherein an effective yarn traversing width is divided into two or more groups. Each group is provided with two superimposed and coaxially arranged blades rotating in opposite directions. The yarn is alternately moved in one traversing direction by the rotating blade and transferred from a blade of one group to a blade of the neighboring group. Directional change of the yarn traverse is performed by the cooperation between the two blades in the terminal groups of the effective yarn traversing width. The point shape of the rotary blade is so designed as to effect a smooth and stable transfer and the directional change of the yarn. Location and dimensions of the blades within the groups are so selected that the rotation thereof should not interfere with the rotation of the blades of the neighboring groups.

3,650,487

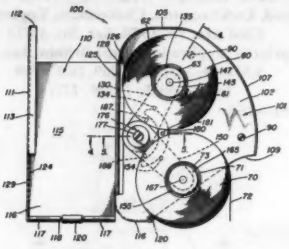
TWO-ROLL TISSUE DISPENSER

Erwin B. Bahnsen, Oakbrook, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Filed Mar. 6, 1970, Ser. No. 17,069

Int. Cl. B65h *19/00, 19/04*

U.S. Cl. 242—55.3 **20 Claims**



A two-roll tissue dispenser comprising a housing having a dispensing opening and a door providing access into the housing, two support arms pivotally mounted in the housing and each carrying a post for tissue rolls disposed normal to the support wall for the housing each of the support arms being pivoted at a common axis and sequentially pivotal only in one direction from a storage position to a dispensing position and then to an exhaust position and then back to the storage position, and latch mechanism automatically controlling the sequential pivoting of the support arms through the four positions named automatically to deliver a tissue roll from the storage position to the dispensing position upon the exhaustion of the tissue roll in the dispensing position; an improved and simplified lock mechanism for such a dispenser has also been provided.

3,650,488

MACHINE FOR WINDING TAPELIKE STRIP ONTO REELS

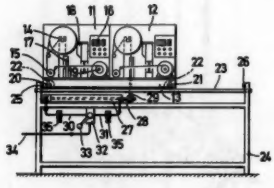
Max Norbisrath, Solingen, Germany, assignor to Spezialpapiermaschinenfabrik August Alfred Krupp, Hilden, near Duesseldorf, Germany

Filed Jan. 27, 1970, Ser. No. 6,126

Claims priority, application Germany, Jan. 25, 1969, G 69 02 873

Int. Cl. B65h *17/02*

U.S. Cl. 242—67.3 **6 Claims**



A machine for winding tape or other narrow strip such as typewriter ribbon onto reels includes two separate winding units each of which is arranged to wind the strip from a storage reel onto another reel. The two winding units are mounted on a carriage which is movable to and fro by a driving mechanism along a rail track so that either one unit or the other can be brought alternately into a servicing position

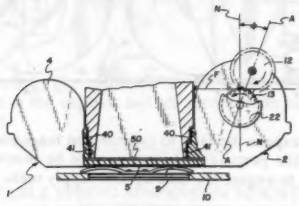
near the middle of the track where the unit is in front of an operator who is able to remove a wound reel and replace it with an empty reel during the time that the other unit is in operation winding the strip onto a reel.

3,650,489

GEAR DRIVE FOR A CAMERA AND FILM CARTRIDGE

Richard J. Bresson, and James E. Dierks, both of Rochester, N.Y., assignors to Eastman Kodak Company, St. Louis, Mo.

Filed Apr. 6, 1970, Ser. No. 26,014
Int. Cl. B03b 1/10
U.S. Cl. 242—71.2 5 Claims



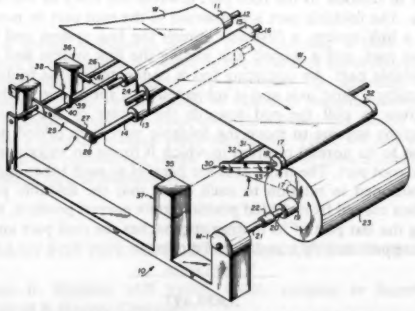
A film cartridge housing encloses a core which is rotatably mounted therein. The housing extends over a gear carried by the spool and defines an opening through which a camera driving gear is insertable for engaging the spool gear and rotating the spool. In a preferred embodiment, the gear axes define a plane which is offset from a normal to the film plane by an angle equal to the pressure angle of the gears, thereby creating a line of force parallel to the film plane. By arranging for such line of force to pass through a cartridge-supporting surface in the camera at a position where the film cartridge contacts the surface, any tendency of the cartridge to be unseated from the supporting surface in response to the creation of a force component normal to the film plane is negated.

3,650,490

CONTROLLED TENSION WEB WINDING APPARATUS

Alan J. Saunders, Somerville, N.J., assignor to Egan Machinery Company

Filed May 7, 1970, Ser. No. 35,326
Int. Cl. B65h 59/38
U.S. Cl. 242—75.3 12 Claims



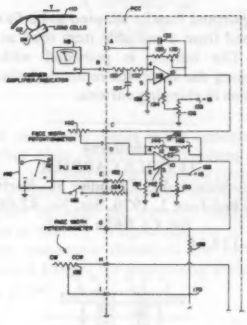
Web winding apparatus in which a web of flexible material is adapted to successively pass over a first idler roll, under a dancer roll, over a second idler roll, over a lay-on roll and then be wound on a wind-up roll. The dancer roll is movable bodily through the medium of a first pair of arms which are pivotal about a first axis and the lay-on roll is movable bodily through the medium of a second pair of arms which are pivotal about a second axis. A mechanism, including a cam and a variable fluid pressure system, is connected to both pairs of arms and is so constructed and arranged as to effect application of programmed tension to the web by the dancer roll in response to bodily movement of the lay-on roll about the second axis during winding of the web on the wind-up roll.

3,650,491

ELECTRONIC WEB TENSION MEASURING AND CONTROLLING SYSTEM

John David Pfeiffer, Downingtown, Pa., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 16, 1969, Ser. No. 885,443
Int. Cl. B65h 25/22, 23/20
U.S. Cl. 242—75.51 16 Claims



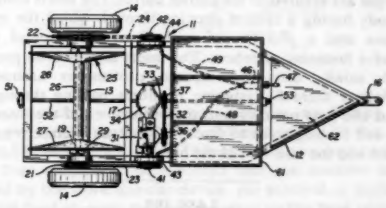
An electronic web tension measuring and controlling system is provided which is stable, fast-responding, and convenient to operate, and which produces an output in meaningful units, the system displaying the actual operating web tension directly in units of pounds per lineal inch (p.l.i.). The actual p.l.i. signal is compared with a set point tension signal dialed in by the operator in p.l.i. units. Any error signal produced is multiplied by a signal proportional to the face width of the web so that a "pounds" error signal is produced. Brake operating time is minimized by utilizing an E/P converter located at the brake.

3,650,492

REEL FOR FENCE WIRE, ETC.

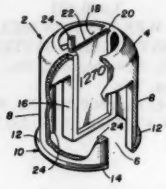
Linly R. Stum, Towner, Colo.

Filed Mar. 5, 1970, Ser. No. 16,753
Int. Cl. B65h 75/40
U.S. Cl. 242—86.7 4 Claims



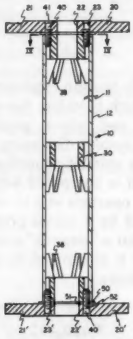
A winding reel support and drive apparatus disposed on a trailer type frame for the placement and retrieval of fence wire and the like. Powered drive apparatus rotates the reel at selected or regulated speeds with a brake system being provided for further control of said reel. Level wind apparatus is used for distributing wire across the reel. Individual reels are removable, and additional reels may be selectively mounted on a drive and support axle for use.

3,650,493
BOBBIN HANDLE
Arthur L. Gottily, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.
Filed Feb. 6, 1970, Ser. No. 9,359
Int. Cl. B65h *75/10*
U.S. Cl. 242—118.3 2 Claims



A multiple purpose handle adapted to be flexingly attached to and detached from a portable item such as a tubular textile bobbin. The handle is provided with features for manually gripping the same, for retaining indicia tags and for stacking bobbins in shipping cartons.

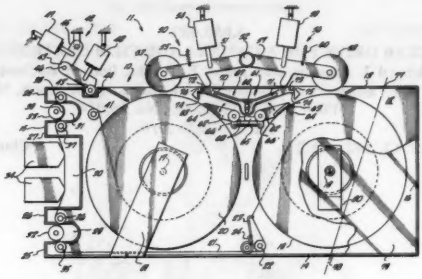
3,650,494
TEXTILE CARRIER
George M. Hutchinson, 403 Chandler St., Hartwell, Ga.
Filed June 2, 1970, Ser. No. 42,684
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.61 15 Claims



A textile carrier having a barrel with two head ends secured thereto. An insert into each end of the barrel provides a bushing and a bearing surface for the spindle while also providing an attachment through which the head ends or flanges are secured to the carrier barrel. The insert comprises a body having a central opening through which the spindle passes and a plurality of projections therearound which receive fastening members. The insert may also be provided with axially extending tapered protrusions around the periphery thereof. Fastening members passing through the head end pass partially into the projections of the insert and are self tapping so as to threadedly secure themselves to the insert and the side wall of the barrel.

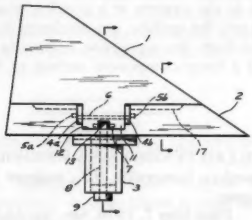
3,650,495
TAPE CARTRIDGE
George Wesley Boyer, Covina, Calif., assignor to Leach Corporation, South Pasadena, Calif.
Filed Dec. 20, 1968, Ser. No. 785,551
Int. Cl. G03b *1/04*; G11b *15/22, 23/04*
U.S. Cl. 242—192 8 Claims

A tape cartridge for a tape recording system is described having a rectangular housing for rotatably supporting a pair of standard reels. The cartridge includes a cover which can be removed to permit access to the interior of the housing to repair the magnetic tape or remove the reels. The cartridge is



adapted to expose the tape to capstan and magnetic head assemblies while permitting drive means to be inserted within the housing to engage the take-up and supply reels.

3,650,496
FOLDING FINS FOR MISSILES
Nils-Ake Birger Svensson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden
Filed May 6, 1970, Ser. No. 35,057
Claims priority, application Sweden, May 14, 1969, 6892/69
Int. Cl. F42b *13/32*
U.S. Cl. 244—3.29 6 Claims

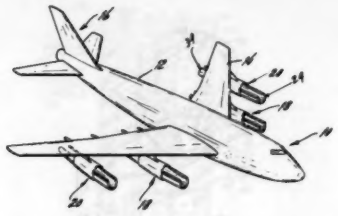


A steering fin or rudder for a guided missile is divided into two parts, viz, a root part and a foldable part which is foldable in relation to the root part towards the body of the missile. The foldable part is connected to the root part by means of a link system, a first axis joining the link system and the root part, and a second axis joining the link system and the foldable part. An operating rod is connected to the foldable part by a third axis and is subjected to a spring force which strives to pull the rod towards the center of the missile, thereby striving to move the foldable part from folded position to its normal position in which it forms an extension of the root part. The three axes are parallel to each other and so positioned in relation to each other that the foldable part, when moved from folded position to its normal position, during the last part of its motion approaches the root part under an approximately translational motion.

3,650,497
JET PROPELLED CHANNELED AIRCRAFT
Willard R. Custer, Hagerstown, Md., assignor to Custer Channel Wing Corporation, Hagerstown, Md.
Filed Nov. 26, 1969, Ser. No. 880,011
Int. Cl. B64c *9/06*
U.S. Cl. 244—12 CW 4 Claims

Jet propelled aircraft having lift enhancing channels connected to the jet engines or nacelles for the same either

directly or contiguously, for close proximity with fluid flow associated with the engines, and with structural refinement. The channels can have airfoil shaped sections to increase lift



and efficiency. The channels can be incorporated forward and/or aft of the engines, and aft channels can be adjustably controlled.

3,650,498

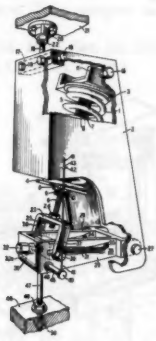
ADJUSTABLE SPRING SUSPENSION MOUNT HAVING CONSTANT STATIC DEFLECTION

James N. Deak, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 2, 1969, Ser. No. 821,281

Int. Cl. F16f *15/00*

U.S. Cl. 248—18 **3 Claims**



A spring suspension mount for protecting a load from shock accelerations by reducing the effects of input shocks to acceptable levels. Means are provided for adjusting the mount so that, when loads of different weights within a preselected range are suspended therefrom, the mount will have a constant overall static deflection. Thus, for any load within the preselected range, the mount will have a constant vertical natural frequency.

3,650,499

CLAMP FOR PIPE SUPPORT WITH SLANTING PIVOTAL ASSEMBLY

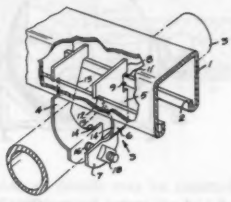
John D. Biggane, Mill Valley, Calif., assignor to Superior Strut & Hanger Company

Filed Jan. 11, 1971, Ser. No. 105,454

Int. Cl. F16l *3/24*

U.S. Cl. 248—62 **3 Claims**

A pair of complementary clamping plates, each plate being curved or dished to form a nesting seat for the pipe and has a pivot and clamping flange on one end of the curved portion, and has a straight flat portion extending tangentially from the other end of the curved portion; one edge of each of the flat portions is perpendicular and has a notch to form a shoulder to hang over one of the inturned flanges in a supporting channel, the other edge of said tangential portion having a shoulder to engage the other inturned flange in the supporting channel and has the edge from its shoulder to the seat converging or slanting toward the opposite edge; the adjacent edge of the nesting seat is cut away in continuation of the slanting edge to form an arcuate edge; the notched perpendicular edge of one of the plates being opposite the slanting edge of the other plate whereby the pivoting of the plates about a loose securing bolt in the clamping flanges and tilting transversely at a slanting angle permits insertion of the plates through the space between the inturned flanges of the supporting channel so that by straightening the plates into nesting attitude the respective shoulders are turned over the respective inturned flanges for suspending a pipe in the seats of the opposite plates.



3,650,500

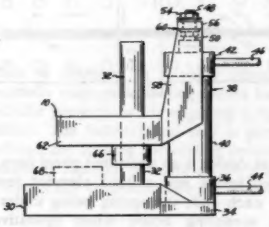
EXTENSIBLE SUPPORT FOR WORK TRANSFER DEVICE

John R. Winne, Detroit, Mich., assignor to Erie Engineering Company, Troy, Mich.

Filed Apr. 24, 1970, Ser. No. 31,524

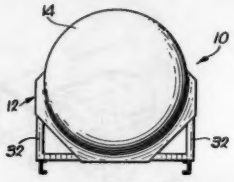
Int. Cl. F16m *13/00*

U.S. Cl. 248—125 **2 Claims**



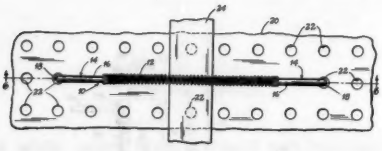
An extensible support is provided for the Lifting and Swinging Work Transfer Device of Kirsch et al. U.S. Pat. No. 3,406,837 of Oct. 22, 1968. This extensible support consists of a base adapted to be mounted near the machine to be served by the work transfer device. An external or auxiliary vertical fluid pressure cylinder mounted on this base contains a vertically-reciprocating reciprocating piston, the piston rod of which carries a cross-head connected to arms which in turn carry a horizontal platform on which the work transfer device is mounted. The auxiliary vertical fluid pressure cylinder, when supplied with pressure fluid, such as compressed air, raises the platform and with it the work transfer device, thereby supplementing and extending the range of lift possessed by the work transfer device itself.

3,650,501
APPARATUS FOR CRADLING TANKS
Ernest L. Streb, Raymondville, Tex., assignor to Frontier Industries, Inc., Raymondville, Tex.
Filed June 15, 1970, Ser. No. 46,187
Int. Cl. B65d 25/24
U.S. Cl. 248—146 8 Claims



A method and apparatus for cradling a tank wherein the latter is constantly held in cushioned, spaced relationship with U-shaped framework of the cradle. The tank is cradled by filling the space between the tank and the framework with an initially fluid, resinous substance which bonds with the framework and the tank as the substance cures to a solid, resilient state. Upon curing, the tank and cradle are integrally bonded into a single composite unit wherein the resinous substance cushions the tank away from the framework to distribute the load evenly over the surface of the tank. A protective, fiber glass sheath enclosing the cradle is bonded to the tank.

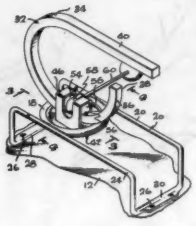
3,650,502
PEGBOARD ITEM
Bruno A. Langhi, St. Louis, Mo., assignor to Ever-Ready Appliance Mfg. Co., St. Louis, Mo.
Filed June 27, 1969, Ser. No. 837,224
Int. Cl. E06b 7/28
U.S. Cl. 248—225 5 Claims



The present device is an apertured panel item comprising a central coiled spring and a hook element removably connected into each end, the spring being under tension and against the mounting board when operatively disposed thereon. Objects are held against the board by the spring.

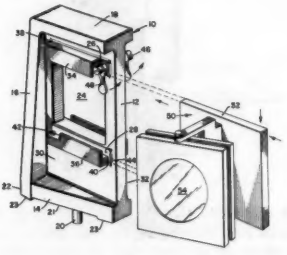
3,650,503
TILT-AND-ROTATE BRACKET ASSEMBLY
Kendall R. Seidel, 4521 Cambury Drive, La Palma, Calif.
Filed May 28, 1970, Ser. No. 41,449
Int. Cl. F16m 13/00
U.S. Cl. 248—285 7 Claims

Mounting assembly for the mounting of devices which must be directed or oriented and then securely locked into position. Examples of such structures are flood-lighting fixtures and closed circuit TV monitor cameras in places of business. An annular base ring is arranged for securement by any convenient means. An annular arcuate swivel having a right cylindrical outer circumference rests upon the base ring to provide movability about the axis of the ring and about the axis of the swivel. The device being mounted is carried on the swivel. Clamping means engages below the base ring and



over the swivel to clamp the two together to secure alignment when positioning is obtained.

3,650,504
OPTICAL MOUNT
James W. Dormody, Bristol, Conn., assignor to Carson Laboratories, Inc., Bristol, Conn.
Filed Apr. 3, 1970, Ser. No. 25,327
Int. Cl. G02b 7/18
U.S. Cl. 248—466 11 Claims

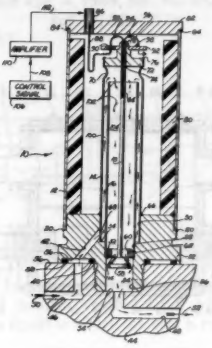


An optical mount comprising a heavy, rigid support member having finished guide surfaces for rigidly mounting one or more optical devices on the support member. The devices are readily installed and removable by an eccentric lock and are isolated from environmental vibration when installed.

3,650,505
THERMAL VALVE
Charles F. Drexel, Rolling Hills Estates, Calif., assignor to Tylan Corporation
Filed Mar. 2, 1970, Ser. No. 15,399
Int. Cl. F16k 31/04; F03g 7/06
U.S. Cl. 251—11 10 Claims

A thermal valve in which heat is utilized to expand an actuator relative to a reference member. The actuator and reference member are interconnected at one end and one or the other carries a valve head on its opposite end whereby a differential in expansion moves the valve head from its seat. Ports are provided to conduct fluid between and in contact with the reference member and actuator and a baffle is

disposed between the reference member and actuator to direct the fluid along the reference member for heat transfer



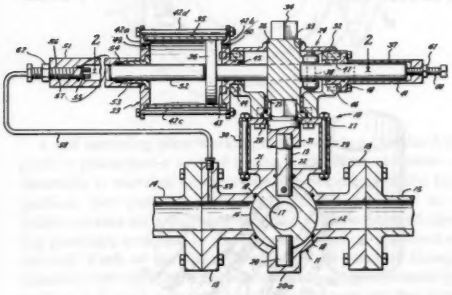
therewith and to effect radiant heat shielding between the reference member and the actuator.

3,650,506

ROTARY VALVE WITH LINE PRESSURE CONNECTED ACTUATOR

Billy R. Bruton, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,236
Int. Cl. F16k *31/163*
U.S. Cl. 251—26 **12 Claims**



A rotary valve having a reciprocable, fluid-actuated operator which rotates the closure member to "fail" position by means of line pressure when there is a failure of power fluid normally used to operate the valve.

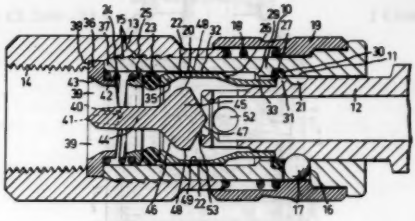
3,650,507

COUPLING SLEEVE FOR COUPLING ENGAGEMENT WITH A NIPPLE

Carl Erik Josef Nyberg, Sylvens vag 6, Skovde, Sweden

Filed Mar. 11, 1970, Ser. No. 18,474
Claims priority, application Sweden, Mar. 14, 1969, 3568/69
Int. Cl. F16l *37/28*
U.S. Cl. 251—149.6 **5 Claims**

A coupling sleeve for coupling engagement with a nipple to form a quick-coupling between two gas or liquid carrying conduits, the coupling sleeve and its internal separate details



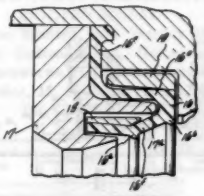
being so adapted that all details may be inserted from one and the same end of the sleeve.

3,650,508

BI-DIRECTIONAL VALVE FOR CRYOGENIC FLUIDS

Ronald W. Kosmala, La Mirada, and Ritchie W. Whitaker, Claremont, both of Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed Feb. 6, 1969, Ser. No. 797,166
Int. Cl. F16k *5/14*
U.S. Cl. 251—174 **12 Claims**



This invention is directed to a valve adapted for bi-directional thermally responsive sealing means having a pair of spaced bead-like projections for engaging a valve disc in leak-proof fashion. The bidirectional seal is provided with means for mechanically loading the sealing means for maintaining a substantially constant pressure on the sealing means to provide an essentially constant sealing load with temperature changes.

3,650,509

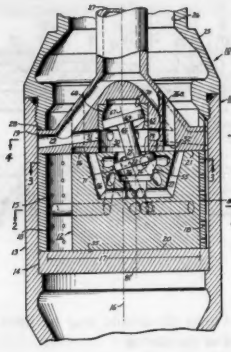
FREE ROTOR VIBRATOR

Leroy E. Swerdfeger, Upland, Calif., assignor to Malan Vibrator Co. Inc., South El Monte, Calif.

Filed Sept. 29, 1970, Ser. No. 76,448
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 **6 Claims**

A free rotor vibrator of the class including a case with an internal cylinder race within which a rotor of less diameter orbits in bearing contact therewith so as to exert a radial centrifugal force which is useful in fields such as the placement of concrete. The invention includes valving means for sequentially connecting force means such as plungers to sources of fluid under alternately elevated and reduced pressure so as to cause the rotor to orbit in the case. The valving means comprises a rigid rod with a universally pivoted joint

at each end, one of which joints carries valving means which sequentially overlaps passages to the force means and connects them alternately to the regions of elevated and reduced pressure.

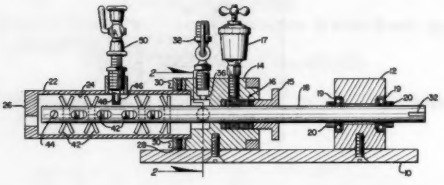


3,650,510

MIXING AND AERATING APPARATUS FOR PLASTICS

Ferman L. Ansel, Arvada, Colo., assignor to Denver Brick and Pipe Company, Denver, Colo.

Filed Apr. 3, 1970, Ser. No. 25,334
Int. Cl. B01f *7/02, 7/08*
U.S. Cl. 259—9 **7 Claims**



Mixing apparatus for liquid plastics, such as polyesters, polyurethane elastomers and polyurethane foams, and liquid additives to same, for effecting certain reactions, characterized by a plurality of mixing rotors which may be optionally employed with basic drive mechanism and liquid supply conduits, common to all rotors, to thereby provide apparatus of variable utility, for the various plastics, by minimizing the number of operative parts required. For certain foaming plastics, air is aspirated into the rotor mixing chamber to provide the required air for initiating foaming by subsequent chemical reaction. For other plastics which require a high shearing action during mixing, alternative forms of rotors are employed which move the plastic in a tortuous path for effecting such action. All rotors are driven at the same speed by a direct drive motor which rotates at 1,700–1,800 r.p.m. (four pole motor) as distinguished from former required speeds of the order of 6,000 r.p.m.

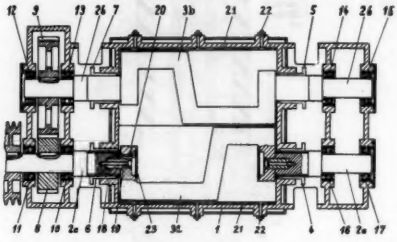
3,650,511

MIXING AND KNEADING DEVICE

Werner Henschel, Muttenz, Switzerland, assignor to Buss A.G., Basel, Switzerland

Filed June 3, 1969, Ser. No. 830,050
Int. Cl. B01f *7/00*
U.S. Cl. 259—104 **3 Claims**

A mixing and kneading device for both dry and moist products, featuring a housing with one or more agitator arms which are mounted rotatably in said housing by means of shafts provided on each side of the arms, said housing being closed off with "pressure resistant" seals at the points of exit of said agitator shafts. The agitator arms and shafts are designed as separate parts which are divided along planes perpendicular to the axes of rotation, and are detachably interconnected by conventional clamping elements, including respective pins coaxial to said shafts.

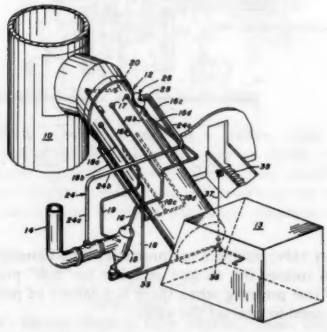


3,650,512

QUENCHING METHOD AND APPARATUS FOR EXHAUST GASES

Lawrence N. Gee, Hobart; Kenneth M. Marrs, and Edwin S. Rutkin, both of Gary, all of Ind., assignors to United States Steel Corporation

Filed Dec. 4, 1969, Ser. No. 881,970
Int. Cl. B01f *3/04*
U.S. Cl. 261—7 **7 Claims**



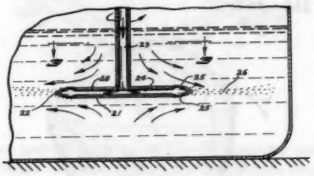
Exhaust gases from an oxygen steelmaking furnace are quenched with water which is recirculated and contains a large quantity of solids. In conventional quenching systems such solids can clog the water pipes. The invention is an arrangement of the pipes which assures gravity drainage during interruptions and prevents solids from accumulating in the pipes and clogging them.

3,650,513

AERATION DEVICE

Frank D. Werner, 5405 Mt. Normandale Curve, Minneapolis, Minn.

Filed Apr. 4, 1969, Ser. No. 813,466
Int. Cl. B01f 7/26
U.S. Cl. 261—87 14 Claims



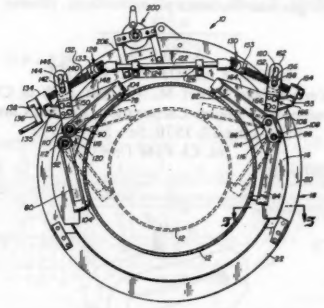
An aeration device comprising a rotating disc having porous surfaces through which a fluid can be passed to be dispersed into a liquid in which the disc is rotating.

3,650,514

SELF CENTERING PIPE WORKING MACHINE

Gerald A. Stunkard, P.O. Box 594, Jenks, Okla.

Filed Nov. 7, 1969, Ser. No. 874,758
Int. Cl. B23k 7/04
U.S. Cl. 266—23 17 Claims



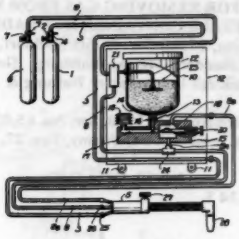
A self centering pipe-working machine has a circular frame portion positionable around a pipe section, an openable ring assembly in movable contact with the periphery of the frame portion, two pairs of clamping members attached to the frame portion on a first side thereof, and two pairs of clamping members attached to the frame portion on a second side thereof. Each of the first mentioned two pairs of clamping members are operably interconnected through universal joint means, and each pair of clamping members on the second side of the frame portion are operably connected to a corresponding pair of clamping members on the first side of the frame portion. Threaded means connects each pair of the first mentioned two pairs of clamping members to the universal joint means to provide the combined clamping and self centering adjustments. The other two pairs of clamping members on the other side of the frame correspond in unison to the first two pairs. Adjustable tool support means is removably attached to the openable ring member for rotative movement around a pipe section to be worked. In one embodiment, driving means is attached to the frame with the driving means having a driven wheel in contact with the rotatable ring assembly in order to rotate the tool support means around the pipe section. In another embodiment of the invention, the driving means includes a driven sprocket member in contact with a chain-like member secured to the periphery of the openable ring assembly in order to drive the ring assembly.

3,650,515

METAL POWDER SPRAY CUTTING APPARATUS

Suichi Okui, 543 Tatsumiyagara-cho, Ikuno-ku, Osaka, Japan

Filed May 21, 1970, Ser. No. 39,316
Int. Cl. B23k 5/00
U.S. Cl. 266—23 S 1 Claim



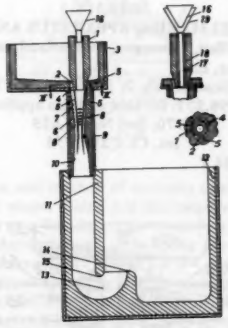
A metal powder spray cutting apparatus comprising a metal powder reservoir, beneath which is a chamber having a metal dropping port crossed by a gas reciprocating route, at the base of which is an expansion accumulator, while said gas reciprocating route has its one end opened in the expansion accumulator and the feeding route for a cutting jet oxygen passes through the expansion accumulator to be connected with a cutting burner, so that metal powders mixed with oxygen may be sprayed out of a spray port in the center of the nozzle at the tip of said cutting burner.

3,650,516

DEVICE FOR INTRODUCING ADDITIVES INTO MOLTEN METAL

Detmar Franz Otto Mantell, and Werner Harald Valentin Mainz, both of Gelsenkirchen, Germany, assignors to Rheinstahl Huettenwerke AG, Essen, Germany

Filed Mar. 25, 1970, Ser. No. 22,650
Int. Cl. C21c 7/00
U.S. Cl. 266—34 T 18 Claims



A device for introducing additives, such as solid substances of low boiling point, into a molten metal includes an intermediate ladle for receiving the molten metal and discharging it from an outlet opening in its base into an outlet pipe extending downwardly from the opening. A feed pipe for introducing additives extends downwardly through the ladle with its lower end located in the outlet opening from the ladle. The lower end of the feed pipe is spaced radially inwardly from the inner peripheral of the ladle outlet opening and provides an annular space which is divided by ribs, extending between the ladle and the lower end of the feed pipe, into a number of angularly spaced open sections or flow passages. The ribs extend downwardly for at least a portion

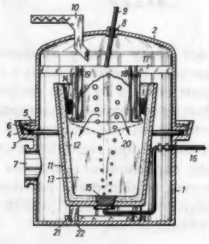
of the length of the outlet pipe and the outlet pipe is arranged to provide, in serial arrangements proceeding from the outlet opening in the ladle, a converging section, a cylindrical section, and a diverging nozzle-like section.

3,650,517

DEVICE FOR REMOVING GAS FROM MOLTEN METALS CONTAINED IN A LADLE

Theodor Messing, Muhlheim (Ruhr) Speldorf, Germany, assignor to Standard-Messo Duisburg Gesellschaft fur Chemietechnik mit beschrankter Haftung & Co., Duisburg, Germany

Filed Aug. 19, 1970, Ser. No. 65,032
Claims priority, application Germany, Dec. 27, 1969, P 19 65 136.6
Int. Cl. C21c *7/10*
U.S. Cl. 266—34 V **12 Claims**



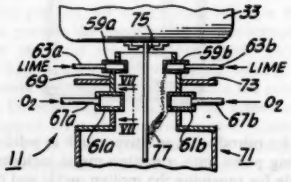
The invention relates to a device for removing gas from steel or other molten metal contained in a ladle. The ladle is housed in a multi-part vacuum container, and a reaction pipe connected to the vacuum container extends into the ladle and is immersed in molten metal when the latter is introduced into the ladle. The inner volume of the reaction pipe is greater than the increase in volume of the molten metal which occurs during degassing and metallurgical treatment of the molten metal.

3,650,518

SPRAY STEELMAKING APPARATUS AND METHOD

William H. Moffatt, Lausanne, Switzerland, assignor to Koppers Company, Inc.

Original application Feb. 2, 1968, Ser. No. 702,570, now Patent No. 3,598,571. Divided and this application Sept. 18, 1970, Ser. No. 73,655
Int. Cl. C21c *5/56*
U.S. Cl. 266—34 T **4 Claims**



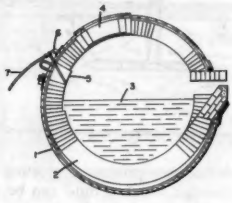
Improved apparatus for carrying out the method of spray steelmaking includes a tundish for holding molten metal that has one or more elongate slots covered by a slidable gate to control the rate and quantity of molten metal flowing from the tundish in the form of one or more thin films of molten metal. Headers on each side of the molten film discharge oxygen and refining materials that react with the molten metal to produce steel.

3,650,519

APPARATUS FOR GASEOUS REDUCTION OF OXYGEN-CONTAINING COPPER

John Vogt; Paul Schmidt, both of Noranda, and Leonard Mills, Murdochville, all of Quebec, Canada, assignors to Noranda Mines Limited, Toronto, Ontario, Canada

Original application Jan. 9, 1968, Ser. No. 696,526. Divided and this application Dec. 31, 1969, Ser. No. 1,917
Int. Cl. C21c *5/48*
U.S. Cl. 266—36 H **9 Claims**



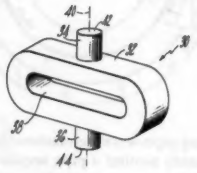
A novel tuyere design in which a metal pipe is secured to the furnace wall and into which a second pipe is inserted to extend for several inches into the molten bath. The apparatus for introducing a gas into a furnace includes an outer pipe secured in a furnace wall and extending from the inner face of the wall to at least the outer face, an inner pipe adapted to be slidably inserted into the outer pipe and being of substantially greater length than the outer pipe, and means for introducing a gas into the inner pipe.

3,650,520

ENERGY ABSORBING DEVICE

John T. Vernon, and Albert M. Ankrom, both of Charlotte, N.C., assignors to Rogers Corporation, Rogers, Conn.

Filed June 29, 1970, Ser. No. 50,742
Int. Cl. F16f *1/44*
U.S. Cl. 267—152 **8 Claims**



An energy absorbing device formed from an integral molded unit of an elastomeric material such as polyurethane. The unit is composed of an annular body portion having an elliptical configuration with relatively thick wall sections and a pair of impact elements projecting from the outer surface of the body portion at stations which lie generally along the minor axis of the elliptical configuration. The resilience of the body portion, and to a more limited extent the impacting elements, allows the device to absorb energy when objects strike the projecting ends of the impact elements.

3,650,521

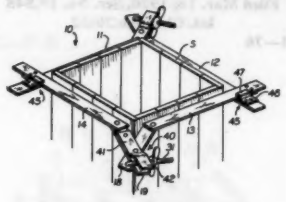
CONCRETE FORM CLAMP

Joseph Meli, New Rochelle, N.Y., assignor to CMI Corporation, Oklahoma City, Okla.

Filed July 31, 1969, Ser. No. 846,357
Int. Cl. E04g *17/00*
U.S. Cl. 269—41 **11 Claims**

A concrete form clamp for use in maintaining the sheathing employed in concrete forms at right angles with respect to each other so as to implement the assembly of the form for use in pouring concrete columns, footings, or the

like structures rectangular in cross section. The clamp is formed with two pairs of clamp bars, the clamp bars of each pair being pivotally joined by means of a pair of pivotally connected pivot links, with a tie member extending between



said links to permit them to be biased toward a position of axial alinement. The free ends of the clamp bars overlap and engage each other at right angles, with the tightening of the tie member between the pivot links serving to draw the clamp bars against the concrete form to be held in place.

3,650,522

MECHANICAL CLAMPING DEVICE, IN PARTICULAR MACHINE VICE

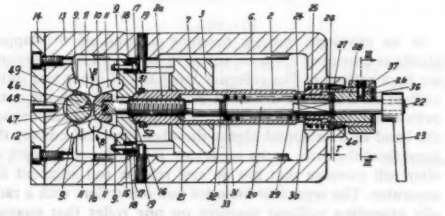
Charles Wermuth, Wangi, and Heinz Wagner, Aadorf, both of Switzerland, assignors to Gressel AG, Kempten am Allgau Spatzenweg, Germany

Filed Dec. 1, 1969, Ser. No. 881,205

Claims priority, application Germany, Dec. 3, 1968, P 18 12 325.6

Int. Cl. B25b *1/14*

U.S. Cl. 269—228 **8 Claims**



A clamp member for a vice or the like. A hollow spindle is threaded into a stationary block and carries a slide member thereon and a drive rod therein. A limited-torque clutch connects a drive rod to said hollow spindle and solid connecting means connects said manual drive means to said drive rod. Upon rotation of the handle, force is transmitted through the limited-torque clutch to rotate the hollow spindle with respect to the stationary block for advancement of same and simultaneous advancement of the slide until the work-engaging plate initially contacts the workpiece. Thereafter, the clutch slips and force is then applied through the drive rod to force multiplication means and applied to the work-engaging plate for imposing clamping force thereon. The drive rod is only torsionally stressed for most of its length and hence is not subjected to bending forces. It is compressively stressed only for a short distance at the end adjacent the force multiplication means and can at this point be readily and adequately guided.

3,650,523

INFANT RESTRAINING BOARD

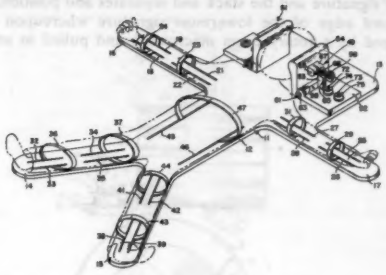
Charles P. Darby, Jr., 90 Broad St., P. O. Box 242, Charleston, S.C.

Filed Jan. 15, 1970, Ser. No. 3,086

Int. Cl. A61f *5/56*

U.S. Cl. 269—328 **4 Claims**

A restraining assembly for children comprises a rigid support board having a head portion at one end adapted to underlie the head of the patient, diverging leg portions at the other end to underlie the legs of the patient, a body portion intermediate the head and foot portions and arm portions projecting from opposite sides adjacent the juncture of the



head and body portions. Releasable patient holding bands pass slidably through a plurality of slots in each of the arm, leg and body portions, and laterally adjustable head holding pads are provided on the head portion.

3,650,524

APPARATUS FOR AND METHOD OF OPENING INTERPOSITIONED FOLDED SHEETS

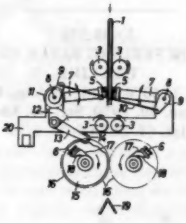
Rudolf Hepp, Schmidt-Ott-Strasse 7a, Berlin, 41, Germany

Filed Dec. 5, 1969, Ser. No. 882,599

Claims priority, application Germany, Dec. 23, 1968, P 18 17 648.2

Int. Cl. B65h *39/02*

U.S. Cl. 270—54 **4 Claims**



Apparatus for and method of centrally opening two folded interpositioned sheets which are deposited with their edges parallel to their rear fold facing forwards by a roller conveyor receiving the sheets through a spreading device onto a conveyor serving as transport means for the open sheets, comprising the steps of: spreading the outer sheet portions apart from the inner sheet portions, and maintaining the outer spread sheet portions while concurrently spreading the inner sheet portions.

3,650,525

APPARATUS AND METHOD FOR SEPARATING SIGNATURES IN A GATHERER

Carlton V. Hageman, and Victoriano F. Rana, both of Easton, Pa., assignors to Harris-Intertype Corp., Cleveland, Ohio

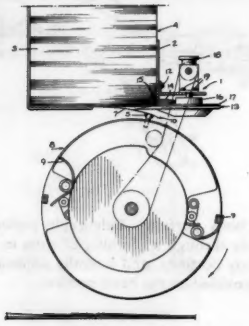
Filed June 10, 1970, Ser. No. 45,010

Int. Cl. B65h *3/08, 3/50*

U.S. Cl. 271—29 **11 Claims**

A signature gathering machine having an improved rotary lifter separator for separating and deflecting the lowermost signature of a stack of signatures in a stack hopper for extraction therefrom while continually supporting the forward

edges of the signatures in the stack thereby reducing pressure and friction on the lowermost signature being extracted and reducing the possibility of the next lowermost signature following the signature being extracted. The rotary lifter separator comprises a disk-like rotary separator having a leading edge which rotates into the stack between a detached lowermost signature and the stack and separates and positions the forward edge of the lowermost signature whereupon it is gripped by a rotary drum mechanism and pulled in an ex-



tracting direction from the stack. The periphery of the upper surface of the disk-like rotary separator continually supports the forward edges of the signatures in the stack as the separator rotates. Additionally, a stack support means supports the forward edges of a portion of signatures in the stack thereby further reducing the pressure and friction on the lowermost signature. A controlling means cyclically releases the support to the portion of signatures permitting them to settle towards the bottom of the hopper.

3,650,526

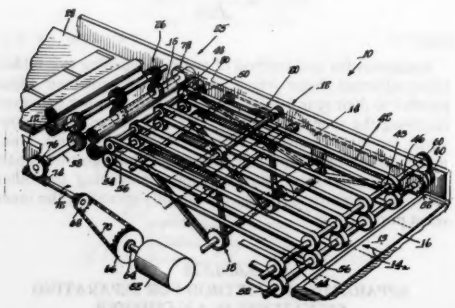
APPARATUS FOR FEEDING PAPER BOOKLETS AND THE LIKE

Herman J. Schultz, 1240 West Morse Ave., Chicago, Ill.

Filed Jan. 20, 1970, Ser. No. 884,643

Int. Cl. B65h *9/04, 9/10*

U.S. Cl. 271—48 **8 Claims**



Apparatus for transporting strips of material comprises longitudinal side frame members, a transporting assembly connected between the side frame members for forwardly transporting paper strips between the frame members and longitudinally therewith, and assemblies for aligning the strips transverse to and laterally with respect to the side frame members.

3,650,527

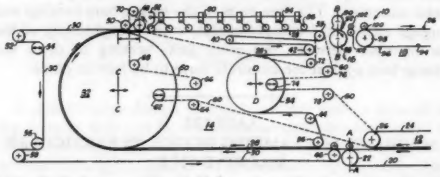
APPARATUS FOR FEEDING A BAND OF OVERLAPPED BLANKS TO A SEPARATOR

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Mar. 16, 1970, Ser. No. 19,848

Int. Cl. B65h *29/12*

U.S. Cl. 271—76 **8 Claims**



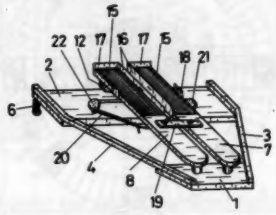
In an envelope making machine a band of overlapped blanks is conveyed from an adhesive drier to a blank separator by a refeeder. The refeeder has pairs of inner and outer endless belts that are driven at the same speed with the outer belts overlying portions of the inner belts. The belts engage the band of overlapped blanks therebetween and convey the band from the drier to the separator. is positioned beneath an idler roll carriage that has an end release roll adjacent the separator. The separator includes pull-out rollers with a radially extending pull-out segment on one roller that engages the front or leading edge of the blank and accelerates the front blank to separate it from the band of overlapped blanks and feed it in timed relation to the subsequent elements of the envelope forming apparatus. When the length of the blank changes or when the dimension of the conveyors in the drier and refeeder increase with increased operating temperatures of the machine, an adjustment is required in the phasing or timing of the blanks delivered to the separator so that the pull-out segment continues to engage the front leading edge of the blank. The disclosed refeeder adjusts the timing of the blanks by changing the effective length of the refeeder conveyor and thus the distance that the band of overlapped blanks travels from the drier to the separator. The length of the refeeder conveyor is changed by moving two reference frames or drums relative to each other. Movement of one reference drum changes the effective length of the path followed by the blanks and movement of the other reference drum changes the effective length of the inner belts. The outer belts have spring loaded take-up idlers that proportionately adjust the effective length of the outer belts to conform to that of the inner belts. An endless chain drive mechanism for the inner and outer belts is connected to the pair, of reference drums so that the effective length of the chain is adjusted with the reference drums. The pitch diameter of the belt drive pulleys and belt drive sprockets is substantially the same so that the chain velocity remains constant and the phase relation of the chain drive changes with the endless belts.

3,650,528

SKI-TRAINING DEVICE

Hans Natterer, 6020 Innsbruck, Austria

Filed Dec. 4, 1969, Ser. No. 882,047
Claims priority, application Austria, Dec. 5, 1968, A 11840/68
Int. Cl. A63b *69/18*
U.S. Cl. 272—57 B 10 Claims



A ski-training device is formed with a base, a pair of ski-like boards pivotally mounted by their front ends on a vertical axis in the front zone of the base and at least one flexible, resilient traction element acting upon the middle zone of the boards over at least two guide rollers rotatably mounted in vertical axes in the rear zone of the base. In use of the device to obtain a realistic feel of movement and forces experienced in technique of skiing, the ski-like boards rotate parallel to one another out of a basic position and are biased for return thereto by spring action.

3,650,529

TREADMILL EXERCISING DEVICE

Vincent A. Salm, 3103 Arcadia Terr., Rockford, Ill., and Daniel B. Carter, Rockford, Ill., assignors to said Salm, by said Carter

Filed Mar. 2, 1970, Ser. No. 15,605
Int. Cl. A63b *23/06*
U.S. Cl. 272—69 8 Claims

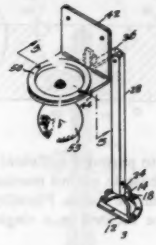
This exercising device is of the treadmill type and comprises three rectangular tubular frames, namely, an open base frame that rests flat on the floor in its operative position, an open handle frame pivotally connected at one end to one end of the base frame and extending upwardly relative to the latter in its operative position, and a roller carrying frame pivotally connected at one end to one end of the base frame inside the same and detachably connectable at its free end in its operative position in either of two height settings relative to the handle frame, rollers on the roller carrying frame extending below the bottom surface thereof and adapted in the horizontal position of said roller carrying frame to provide rolling support to said exercising device in its folded condition, in which the handle frame can be raised and used in pushing or pulling the folded device about on the floor.

3,650,530

HEIGHT ADJUSTABLE BASKETBALL HOOP AND PUNCHING RACK

Emmett J. Gantz, 1007 South 14th St., Burlington, Iowa

Filed Apr. 11, 1969, Ser. No. 815,324
Int. Cl. A63b *63/04*, *69/22*
U.S. Cl. 272—78 3 Claims



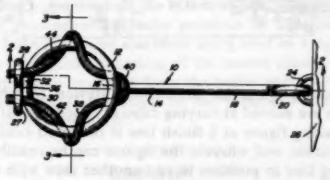
A device comprising a telescoping standard adjustable as to height. A combination basketball hoop and backboard is secured to the top of said standard. The hoop presents in plan an annular surface. A punching bag rebound board fits within said loop and has an annular flange overlying said hoop and secured thereto. A hood is provided to receive a basketball. Said hood carries a loop to secure the hood and ball to said board.

3,650,531

FRICTION RESISTANCE EXERCISER

David I. Pridham, 8410 Diane Ct., Gilroy, Calif.

Filed Mar. 13, 1970, Ser. No. 19,430
Int. Cl. A63b *21/00*
U.S. Cl. 272—79 A 5 Claims



An exercise device for anchoring to a suitable support and including a ring provided with an outwardly projecting binding post portion at one point along its circumference and a pair of at least slightly circumferentially spaced guides disposed generally diametrically opposite the post portion. A length of flexible rope is provided with its mid-portion passed about the post portion and the opposite end portions thereof each spiraled at least once about the connecting portions of the ring extending in opposite directions from the post portion to the guides and then through the guides. The rope may be longitudinally shifted relative to the guides, the connecting ring portions and the post portion by pulling on either free end of the rope and a greater pull on the rope is resisted by greater frictional resistance to the rope being longitudinally shifted relative to the post portion, connecting portions and guides.

3,650,532

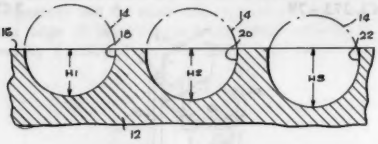
SKILL GAME

William J. Dederich, and Howard S. Scar, both of Los Angeles, Calif., assignors to Synanon Foundation, Inc., Santa Monica, Calif.

Filed June 13, 1969, Ser. No. 832,942
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R 2 Claims

Skill game comprising a base and a ball. Base has a recess which accepts the ball, the diameter of the recess being

larger than the ball to prevent binding and close to the same diameter to permit manual grasp on the ball only to the extent the ball extends from the recess. The recess has a depth greater than the ball radius and less than the ball diameter



and is of such depth to permit a sufficient amount of the ball to extend above the base to permit manual removal with difficulty of the ball from the recess. Plurality of recesses of different depths may be located in a single base or separate similar bases.

3,650,533

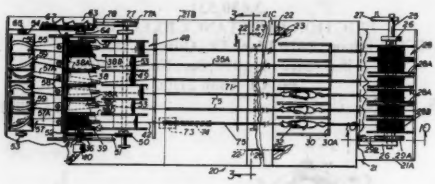
RACE GAME WITH RANDOMLY DRIVEN REEL DRIVE MEANS

Aladar Heppes, 34 Great Hill Road, Ridgefield, Conn.

Filed Aug. 17, 1970, Ser. No. 64,464

Int. Cl. A63f 9/14

U.S. Cl. 273—86 G **19 Claims**



A racing game or amusement device in which racing figures are moved at varying rates of speed so that the arrival of a racing figure at a finish line is rendered completely unpredictable, and wherein the figures can be readily reset at a starting line in position to run another race with completely different results. The device comprises a simulated race track with a plurality of racing figures mounted for movement along the track. Each figure is independently moved in a manner to advance along the track by means of cords arranged to be simultaneously wound and unwound about complementary winding and rewinding reels located at the opposite ends of the track. The arrangement is such that the winding rate of each cord about its winding reel differs from that of the other cords; the several winding rates being completely unpredictable, so that the movement of the respective racing figures varies and the winning figure can not be determined in advance. The track includes a starting section, a finishing section, and one or more intermediate sections which can be interconnected between the starting and finishing sections.

3,650,534

BOARD GAME APPARATUS

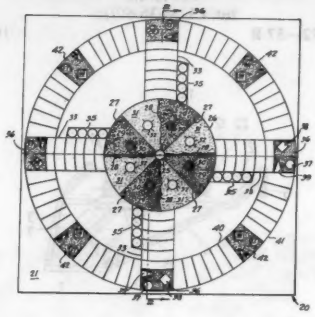
Frank W. Collett, Box 943, Fort Pierce, Fla.

Filed Apr. 10, 1970, Ser. No. 27,344

Int. Cl. A63f 3/02

U.S. Cl. 273—134 AE **6 Claims**

A game apparatus for simulating rocket travel including blastoff and splashdown and including a board having an orbit path around which the playing pieces may travel a variable number of times a determined by chance. A playing piece having three different attitudes, with a base for each attitude having a special shape, is provided carrying magnetically attached markers and is moved about the game board which has separate sockets each shaped to accept one of the



special shape bases of the game piece in one of its several attitudes. Dice are used to provide the element of chance in the game.

3,650,535

MOTOR DRIVEN ROTATABLE DRUM CHANCE DEVICE

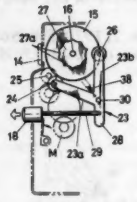
Haruo Ohki, No. 2-10, 2-chome Shiratori, Katsushika-ku, Tokyo, Japan

Filed July 8, 1970, Ser. No. 53,245

Claims priority, application Japan, Oct. 13, 1969, 44/96716

Int. Cl. A63f 5/04

U.S. Cl. 273—143 R **2 Claims**



An amusement device is disclosed which essentially comprises a plurality of display drums each provided on its peripheral surface at circumferentially spaced positions with combinations of symbols, a pushbutton arrangement for stopping rotation of the drums successively so as to pair or match the symbols on one drum with those on another and a handle lever for releasing the depressed pushbuttons.

ERRATA

For Classes 274—4 and 274—10 see:
Patent Nos. 3,650,413 and 3,650,539

3,650,536

ROTARY SHAFT SEAL STRUCTURE

Robert M. Shields, 4609 Carlyle Cir., Kettering, Ohio

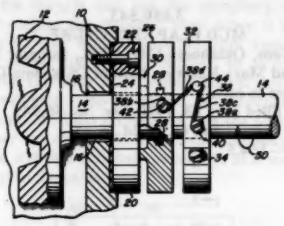
Filed Apr. 9, 1970, Ser. No. 26,868

Int. Cl. F16j 15/34

U.S. Cl. 277—93 **13 Claims**

Rotary shaft seal structure for sealing between a rotary shaft and a housing from which the shaft extends, the housing

containing fluid. A stationary sealing member is carried by the housing and encompasses the shaft. A rotary sealing member is carried by the shaft and engages the stationary member. A drive member is secured to the shaft for rotation therewith. A control member joins the rotary sealing member



to the drive member and applies a resultant force to the rotary sealing member which force is not parallel to the axis of rotation of the shaft. Thus, any movement of the rotary member with respect to the stationary member is both rotational and axial.

3,650,537

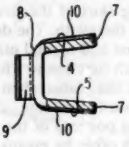
OIL RING OF ONE PIECE TYPE

Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1970, Ser. No. 84,696

Int. Cl. F16j *9/20*

U.S. Cl. 277—160 **4 Claims**



An oil ring of the one piece type has a chrome plated outer edge periphery, its upper and lower sides are inclined radially outwardly, and an expander is attached to the back thereof having resiliency in the radial direction.

3,650,538

ARRANGEMENT AT FEED COLLET

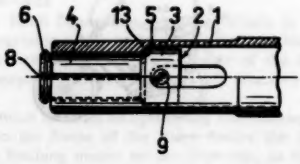
Karl Henning Svensson, 69 Stamgatan, Alvsjo, Sweden

Filed Oct. 29, 1969, Ser. No. 872,101

Claims priority, application Sweden, Oct. 31, 1968, 14761/68

Int. Cl. B23b *31/12*

U.S. Cl. 279—51 **6 Claims**



In a feed collet for use in automatic machines the arrangement of a sleeve to prevent scratches in the material to be worked and rendering it possible to use one and the same feed collet for several material dimensions.

3,650,539

RECORD CHANGER

Philip Vazzano, Des Plaines, Ill., assignor to Warwick Electronics Inc.

Filed Jan. 15, 1970, Ser. No. 3,037

Int. Cl. G11b *17/04*

U.S. Cl. 274—10 S **4 Claims**

A record changer having mechanism associated with the center spindle thereof for detecting the absence of records in a record stack on the spindle for operating the record changer in a last record shut-off cycle, with the stack detecting mechanism not being sensitive to the weight of a record or records in the record stack. The spindle carries a sensing member movable outwardly of the spindle body for detecting record presence and controls the extent of elevation of an actuating pin, dependent upon the presence or absence of a record, with the particular elevation being used as a signal to control the subsequent operation of the record changer. The spindle is manually operable from the upper end thereof to discharge records of the stack to the turntable when the record changer is not in use.

3,650,540

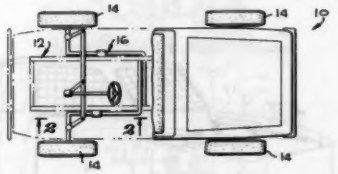
VEHICLE SUSPENSION SYSTEM

Donald J. Verley, 444 Sunnycrest Drive, Los Angeles, Calif.

Filed Feb. 6, 1970, Ser. No. 9,193

Int. Cl. B60g *11/18*

U.S. Cl. 280—124 B **9 Claims**



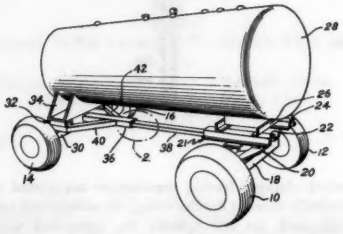
A wheel suspension system for vehicles, particularly relatively light-weight low-speed vehicles such as golf carts, industrial utility vehicles, and the like. The suspension system includes a suspension arm for each wheel extending longitudinally of and pivotally mounted at one end on the vehicle frame for vertical swinging movement of the wheel and arm

about a transverse axis of the frame, and a spring for yieldably resisting upward and downward rotation of the arm relative to the frame. A primary feature of the invention resides in a restraining device which acts between the frame and each wheel suspension arm to yieldably resist, cushion, and damp deflection of the arm laterally of the frame during cornering and under other driving conditions that impose a lateral deflection load on the arm. In the disclosed inventive embodiment, each wheel suspension arm is furnished by a one-piece metal rod whose ends are bent laterally to form a wheel support and a torsion spring bar on the arm.

3,650,541
FLEXIBLE REACH

Elmo R. Meiners, Anchor, Ill., and John O. Bradford, Gibson City, Ill., assignors to said Meiners, by said Bradford

Filed Mar. 5, 1970, Ser. No. 16,813
Int. Cl. B62d *9/00*
U.S. Cl. 280—140 **3 Claims**

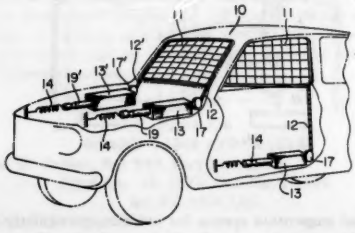


An improved flexible reach for attaching the front and rear wheels of a farm wagon or the like includes an outer channel member connected with the rear pair of wheels and an inner channel member connected with the front pair of wheels. The channel members are longitudinally slidable one within the other and have a rectangular cross section. A pin fastens the channel members together to provide a desired wheel base for the farm wagon.

3,650,542
MOTOR VEHICLE SAFETY DEVICE

Akira Shimano, Yokohama; Shin Maki, Tokyo; Katsuzi Ohyama, Yokohama, and Hiromichi Ochiyama, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed July 18, 1969, Ser. No. 843,067
Claims priority, application Japan, July 22, 1968, 43/62051; Apr. 22, 1969, 44/30738
Int. Cl. B60r *21/02*
U.S. Cl. 280—150 B **13 Claims**

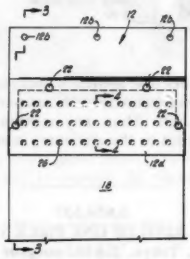


A motor vehicle safety device to avoid whip-lash injuries of the vehicle occupants. The device has a stored netting which is automatically positioned in front of the occupants by trigger mechanism responsive to deceleration of a given magnitude of the motor vehicle. The netting is constructed to hold the occupant's head firmly without injury to the neck of the occupant and preclude the head from reverse or backward movement.

3,650,543
MUD FLAP STRUCTURE

James P. Evans, Oklahoma City, Okla., assignor to Polly E. Trindle and Mary Kathryn, both of Oklahoma City, Okla., part interest to each

Filed May 13, 1970, Ser. No. 36,941
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 **9 Claims**



A mud flap structure which includes a first bent plate having a downwardly depending skirt, a second bent plate pivotally connected to the first plate and having a downwardly depending skirt which is spaced from the downwardly depending skirt of the first plate and defines a flap receiving channel therewith. The downwardly depending skirt portions of the first and second plates carry cooperating holes and dimples which function to frictionally retain a flexible mud flap between the plates when the upper portion of the mud flap is passed into the channel between the downwardly depending portions of the plates, and the plates are drawn toward each other by means of a plurality of bolts extended through the plates but not through the mud flap.

3,650,544
BICYCLE STABILIZER

Arnold Cassell, 47 Princeton Ave., Hewlett, N.Y.

Filed June 30, 1970, Ser. No. 51,064
Int. Cl. B62h *7/00*
U.S. Cl. 280—293 **7 Claims**

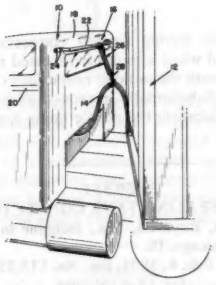
The disclosure relates to a stabilizer attachment for a bicycle, and includes a clevis or furcated member positionable over a bicycle wheel and affixed to the wheel axle. A stabil-

izer mast projects upwardly from the clevis member and a ring-like loop member is adapted to be used in conjunction with the stabilizer mast. The loop member is preferably handheld in a circumscribing position with relation to the mast so that the periphery of the loop member is spaced from the mast and a person holding the loop member and moving alongside the bicycle can use the periphery of the loop member to engage the stabilizer mast when it is desired to prevent the bicycle, while in motion, from tipping over and to thereby restore the cyclist's balance. In an alternate embodiment the stabilizer mast is provided at one end with a rotatably mounted loop member. A suspended cable is passed through the loop member so that the periphery of the loop member will engage the cable when the bicycle tends to tip over and will thus stabilize the bicycle as it moves along a path parallel to the cable.

3,650,545
HOSE SUPPORT AND GUIDE

William E. Freed, Box 97, Jonesville, N.C.

Filed Mar. 9, 1970, Ser. No. 17,610
Int. Cl. B60d *1/08*
U.S. Cl. 280—421 **4 Claims**



A slide bar is positioned upon a first vehicle component for supporting and guiding flexible lines extending between interconnected vehicle components. A flexible, resilient member interconnects the slide bar and a member which grips the flexible lines for permitting displacement of the gripping member and the resilient member laterally of the first vehicle.

3,650,546
TRAILER HITCH

Alvin D. Koenig, Route 1, Box 1645, Smithfield, Tex.

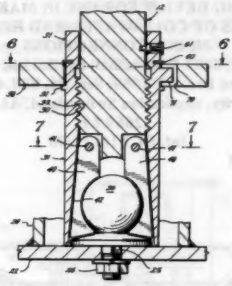
Filed July 22, 1970, Ser. No. 57,040
Int. Cl. B62d *53/00*; **B60d** *1/06*
U.S. Cl. 280—423 **6 Claims**

A trailer hitch connecting a trailer vehicle to a tractor vehicle comprising a pick up truck, the trailer vehicle having a draw bar extending over the tail gate of the truck and turned downwardly at its front end for attachment to the truck.

The invention includes an upstanding ball hitching element mounted on the frame of the truck, below the floor, and companion hitching means on the draw bar, as hereinafter described, extending through a hole in the floor for engagement with the ball.

The downwardly turned front end portion of the draw bar is round in transverse section and has a pair of diametrically opposed dogs pivotally connected to its lower end and depending therefrom for overlying engagement with opposite sides of the ball, to secure the ball between them.

A cylindrical member surrounds the lower end of the draw bar, to which it is connected by threads, and extends downwardly therefrom, around the dogs. The cylindrical member has its interior surface tapered downwardly and radially outwardly adjacent its lower end for overlying engagement with the opposing outer surfaces of the dogs, to squeeze them radially inwardly in clamping engagement with the ball, in the lowermost position of the cylindrical member



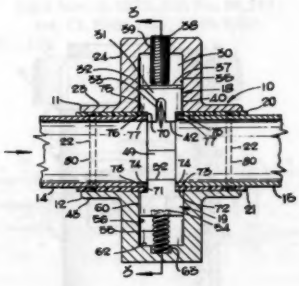
relative to the draw bar.

The invention further includes handle means on the cylindrical member for turning it on its threads to thereby adjust it longitudinally relative to the draw bar. The handle means consists of a hand wheel loosely encircling the cylindrical member and adjustable circumferentially relative thereto. The hand wheel and the cylindrical member have mutually opposing means for abutting engagement with each other to limit circumferential adjustment of the hand wheel relative to the cylindrical member within fixed predetermined limits.

3,650,547
PIPE FITTING

Edward F. Tickett, El Paso, Tex., assignor to Alex B. Reynolds, St. Louis, Mo.

Continuation-in-part of application Ser. No. 864,739, Oct. 8, 1969, now abandoned , Continuation-in-part of application Ser. No. 54,398, July 13, 1970. This application Mar. 5, 1971, Ser. No. 121,439
Int. Cl. F16l *21/02*, *21/06*
U.S. Cl. 285—3 **7 Claims**



This pipe fitting is formed from a pair of coupling halves which are fastened together about a continuous pipe. One of the coupling halves includes a built-in cutter assembly capable of severing the pipe into sections which are subsequently

coupled together by the coupling halves. The other coupling half includes a built-in spacer assembly providing an insulated spacer block which is inserted between the ends of the separated pipe sections. The pipe sections are electrically insulated from each other by the spacer block and by insulated pipe liners carried by the coupling halves to facilitate cathodic protection. Continuous seals between the coupling halves preclude the escape of fluid from the separated pipe sections.

3,650,548

PIPE-SPACING DEVICE FOR USE IN MAKING WALL-BATTERIES OF COLD-WATER AND HOT-WATER PIPING CONNECTIONS

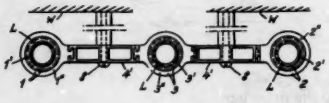
Walter Hussauf, 8497 Fischenthal, Kt. Zurich, Switzerland

Filed Dec. 12, 1969, Ser. No. 884,415

Claims priority, application Switzerland, Aug. 22, 1969, 12669/69

Int. Cl. F16l *39/00*

U.S. Cl. 285—3 **7 Claims**



A pipe-spacing device, comprises a sleeve of nonmetallic (synthetic-resin) material in which a metallic sleeve is embedded to receive the ends of a pair of pipes. The outer synthetic-material sleeve is formed with a T-profile axially extending formation receivable in a channel extending along a side of a generally rectangular spacer element provided with at least two such channels and with means enabling the device to be affixed to a support. The channels have overhanging ledges.

3,650,549

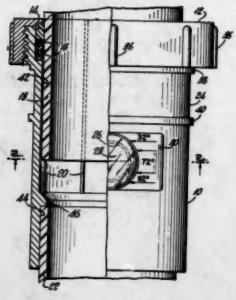
DRAIN, WASTE AND VENT EXPANSION JOINT

Kenneth V. Pepper, Davison, Mich., assignor to Esso Research and Engineering Company

Filed June 18, 1970, Ser. No. 47,340

Int. Cl. F16l *47/02*

U.S. Cl. 285—27 **1 Claim**



A drain, waste and vent pipe expansion joint or connector for use with plastic pipe is provided with (1) a thermal guide for proper positioning of a mating pipe at installation temperature to allow for linear expansion or contraction of the pipe, (2) a transparent window for visual inspection of the completed assembly, and (3) a positive means for sealing the connection so as to prevent leakage of gas or liquid wastes.

3,650,550

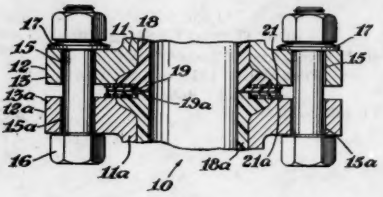
LINED CONDUIT

Walter H. West, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1970, Ser. No. 63,548

Int. Cl. F16l *13/00*

U.S. Cl. 285—55 **7 Claims**



In lined conduit having flanged connections, improved joints are obtained when a multiple recessed rigid support is employed underneath the molded raised face of the flange of the plastic liner. Substantially improved joints are obtained under conditions wherein the plastic lining is subject to cold flow.

3,650,551

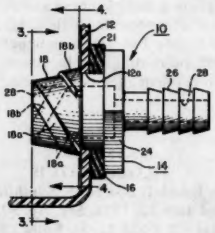
SELF-SEALING TANK CONNECTOR

Edward G. Akers, Raytown, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,530

Int. Cl. F16l *3/04*

U.S. Cl. 285—158 **8 Claims**



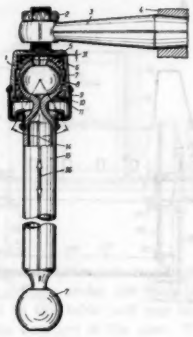
A fitting having a tapered threaded section, formed by flat-topped threads gradually increasing in height, permits the fitting to be screwed into and permanently retained in an aperture in a wall of a semi-rigid tank. As the threaded section is screwed into the aperture the tank wall distorts increasingly and is then led into an annular relief section, following the threaded section, to captivate the fitting against axial movement. The connector also includes a resilient gasket lying in and encompassing the relief section on the outside of the tank. The gasket is held between, and is compressed by, the tank wall and a flange section of the fitting to provide a fluid-tight seal.

3,650,552

BALL JOINT, ESPECIALLY FOR THE STEERING LINKAGE OF MOTOR VEHICLES

Leopold F. Schmid, Pischekstrasse 49, 7000 Stuttgard-O, Germany

Filed Mar. 31, 1970, Ser. No. 24,111
Claims priority, application Germany, Apr. 1, 1969, P 19 16 579.8
Int. Cl. F16c *11/06*
U.S. Cl. 287—90 RJ 3 Claims



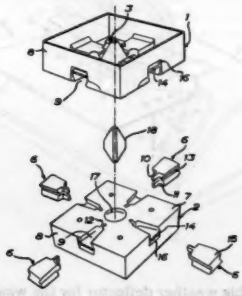
A ball joint, especially for the steering linkage of motor vehicles, in which the ball head is journaled in ball socket means provided with annularly arranged spring elements of different spring characteristics which spring elements are adapted under increasing load successively to abut a portion of the ball joint housing so that successively the spring elements of different spring characteristic become effective.

3,650,553

PILE CONNECTING DEVICES

Elof Algot Wennstrom, Orebro, Sweden, assignor to AB Jarnforadling, Hallefors nas, Sweden

Filed Mar. 30, 1970, Ser. No. 23,840
Claims priority, application Sweden, Mar. 28, 1969, 4366/69
Int. Cl. F16b *7/00*
U.S. Cl. 287—130 7 Claims



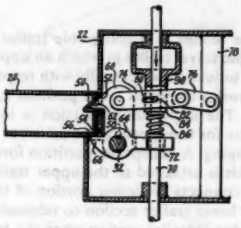
A pile connecting device comprises two plate-shaped members which are adapted for connection with the ends of two pile sections to be joined together and which in the connecting position snugly engage one another by means of planar surfaces. These planar surfaces are provided with registering grooves which extend inwardly from the edges of the plate members and are of dove-tailed cross section, the grooves accommodating locking wedges of double dove-tail configuration in cross section. At their inner ends the wedges have projections which shall cooperate with curved recesses at the inner ends of the grooves. As a result, the wedges when driven into the grooves will be reliably anchored to the plate-shaped members.

3,650,554

TAMPER PROOF LOCKING MECHANISM

Emery C. Tharp, 430 Powell St., Indianapolis, Ind.

Filed Dec. 9, 1970, Ser. No. 96,548
Int. Cl. E05c *19/10*
U.S. Cl. 292—127 4 Claims



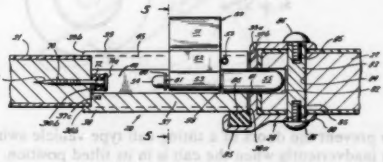
A push-pull shaft having an end of each of two links mounted thereon and separated from each other by a spring, the other end of one of the links being pivotally attached to a door latch, the other end of the door latch being keyed to a rotatable shaft, and the other end of the other link forming a latch return dog that kicks open the door when the push-pull shaft is moved to remove the door latch from the recess of the door and press the spring against the link or latch return dog which is rotatably mounted on the rotatable shaft.

3,650,555

DOOR LATCH WITH A CONCEALED SELF-SECURING ARRANGEMENT

Ralph B. Mott, Sr.; Ralph B. Mott, Jr., and Richard C. Cantella, all of Houston, Tex., assignors to Reserv-A-Roll Co.

Filed Nov. 3, 1970, Ser. No. 86,511
Int. Cl. E05c *1/04*; E05b *9/08*
U.S. Cl. 292—145 7 Claims



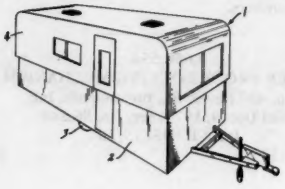
A door latch with a self-securing arrangement securing the latch to a hinged door to inhibit removal or destruction of the latch and to deter vandalism.

3,650,556

FOLDING SCREEN FOR TELESCOPIC TRAILER

John W. Ratcliff, Marengo, Ill., assignor to Ratcliff Industries, Inc., Marengo, Ill.

Filed Aug. 28, 1970, Ser. No. 67,748
Int. Cl. B60p 3/32
U.S. Cl. 296—23 C 7 Claims



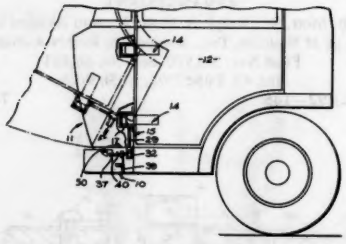
This invention relates to a collapsible trailer partition for use in a telescopic travel trailer in which an upper trailer section is disposed to telescope vertically with respect to a lower trailer section from a retracted lower position to an extended upper position. The upper trailer section is lowered to the retracted position for transporting and raised to the extended position for camping. A collapsible partition formed of multiple hinged panels is attached to the upper trailer section. A magnetic latch connects the lower portion of the collapsible partition to the lower trailer section to releasably secure the partition to the lower trailer section when the trailer is in extended upper position. The magnetic latch disengages to allow the partition to collapse in an accordion manner when the upper trailer section is lowered to the retracted position.

3,650,557

MOTOR VEHICLES

John T. Dudley, Brewood, England, assignor to GKN Sankey Limited, Bilston, Stafford, England

Filed Mar. 9, 1970, Ser. No. 17,853
Claims priority, application Great Britain, Mar. 11, 1969, 12,775/69
Int. Cl. B62d 33/06
U.S. Cl. 296—28 C 6 Claims



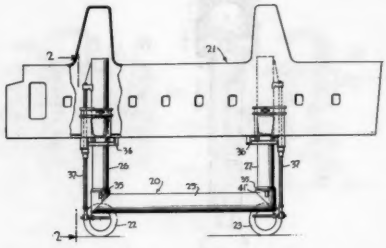
To prevent the doors of a tilting cab type vehicle swinging open inadvertently when the cab is in its tilted position, each door is provided with arrester means which are operative when the cab is tilted but disabled when the cab is in its normal position. The arrester means comprise a ratchet and pawl device, the pawl device being spring urged into engagement with the ratchet through the intermediary of a pivoted arm, the ratchet and pawl device and the arm being mounted on the cab adjacent to the respective door. An adjustable stop is mounted on the chassis of the vehicle and arranged to engage the arm when the cab is in its normal position so as to disengage the pawl from the ratchet. The ratchet may be afforded by a part secured to the door hinge, a part of the door hinge itself, or a check strap.

3,650,558

VEHICLE CHASSIS FRAME CONSTRUCTION

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to Boothe Airside Systems, Inc.

Filed Dec. 31, 1969, Ser. No. 889,412
Int. Cl. B62d 31/02
U.S. Cl. 296—28 A 10 Claims



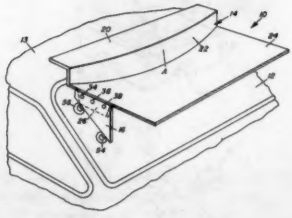
This application discloses a vehicle chassis frame construction which provides a strong rigid connection between a longitudinal frame member or beam and a vertical frame member or column which will resist the variously applied loads between the chassis traveling over uneven surfaces and a body or pod which is subject to heavy loading and which is located at various elevations relative to the chassis frame, specifically, the connection involving the angular tubular joint between a horizontal tubular member and a vertical tubular member.

3,650,559

WEATHER DEFLECTOR FOR AUTOMOBILE WINDSHIELD

George A. Powers, Jacksonville, Fla., assignor to Rainshield, Inc., Jacksonville, Fla.

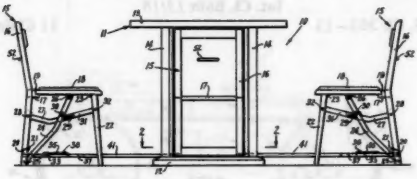
Filed Apr. 3, 1970, Ser. No. 25,370
Int. Cl. B60j 1/20
U.S. Cl. 296—95 R 3 Claims



A removable weather deflector for the windshield of an automobile, including a top member and two side members, is disclosed. The top member has an upper horizontal portion, an intermediate downwardly extending curved portion and a lower horizontal portion which acts as a visor to keep rain and snow off the windshield. The two side members are ad-

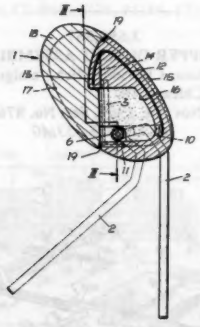
justably secured to the top member and can be secured directly to the windshield of the automobile to support the top member.

3,650,560
FOLDING CHAIR AND TABLE SET
Henning H. Wohlk, 1812 W. Pacific, Spokane, Wash.
Filed Feb. 5, 1970, Ser. No. 8,849
Int. Cl. A47c *15/00*
U.S. Cl. 297—140 **5 Claims**



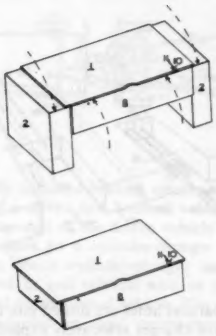
A folding chair and table set in which the chairs individually fold for storage under the table. Each chair is individually attached to the table and can be moved about a central pivot for the comfort of the user. The folding of the chairs reduces the distance from the front legs to the back legs of the chair and in addition reduces the overall height of the chair to permit it to be stored under the table top without raising the top.

3,650,561
HEADREST
Eberhard O. Faust, Bernhausen, and Klaus Keith, Darmsheim, both of Germany, assignors to Recaro A.G., Glarus, Switzerland
Filed Aug. 22, 1969, Ser. No. 852,199
Claims priority, application Germany, Aug. 28, 1968, P 17 80 300.8
Int. Cl. A47c *1/10, 7/12;* **A61g** *15/00*
U.S. Cl. 297—391 **11 Claims**



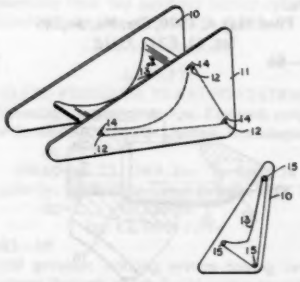
A headrest for a seat of a motor vehicle which is especially designed for protecting the seat occupant and a person sitting behind him from injuries especially in accidents. It comprises two complementary parts of foam plastic which are connected to each other and one of which is soft and resilient and forms the part on which the seat occupant may rest his head or neck, while the second part is of a harder and tough composition with a smooth outer surface and has embedded therein a curved reinforcing plate of a solid but deformable material which is secured to an angle bracket which is pivotably connected at the inside of the second part to supporting rods which may be secured to the backrest of the seat.

3,650,562
FOLDING FOOTSTOOL
Louise Adler, 359 Clarke Ave., Montreal, Quebec, Canada
Filed July 7, 1970, Ser. No. 52,813
Claims priority, application Canada, Nov. 19, 1969, 067,860
Int. Cl. A47c *9/12, 4/02;* **A47b** *47/00*
U.S. Cl. 297—439 **4 Claims**



The invention relates to a folding footstool which, when in its operative position, has a main box-like structure forming a foot supporting portion with a pair of pedestals supporting the main structure. In its inoperative position, the hingeable panels forming the main structure, are adapted to embrace the pedestals so that a neat and compact box is provided for carrying purposes.

3,650,563
TAKE APART MULTIPLE POSITION CHAIR
Margaret S. Hansson, and Leonard S. Matejcic, both of Boulder, Colo., assignors to Gerico, Inc., Boulder, Colo.
Filed Mar. 2, 1970, Ser. No. 15,492
Int. Cl. A47c *4/12, 9/12*
U.S. Cl. 297—441 **7 Claims**



A multiple position chair comprises a pair of rigid side walls of triangular or other configuration providing a plurali-

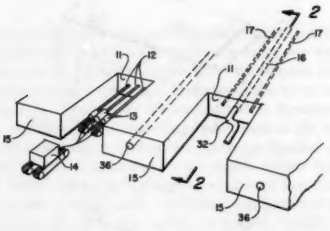
ty of stable resting positions and three or more dowels holding the walls in spaced relationship. A flexible band or belt of canvas or other suitably strong material is arranged about the dowels and provides a seat in two or more of the stable positions of the chair. One of the positions may have curved floor engaging edges to provide a rocking chair. The entire assembly may be taken apart readily by removal of locking pins in the ends of the dowels.

3,650,564

MINING METHOD FOR METHANE DRAINAGE AND ROCK CONDITIONING

Thomas N. Williamson, San Mateo, Calif., assignor to Jacobs Associates, San Francisco, Calif., a part interest

Filed June 15, 1970, Ser. No. 46,270
Int. Cl. C06c *5/00;* **E21c** *27/20*
U.S. Cl. 299—11 **9 Claims**



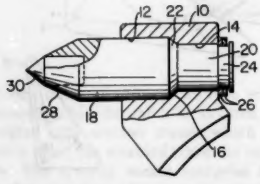
Deep (long) parallel holes are drilled into a mine or tunnel face and explosive charges selectively exploded in some, but preferably not all, of such holes to fragment surrounding rock and join the holes. Methane migrates through the fractured formation to the hole which has not been exploded, or to a separately drilled drainage hole, and the unexploded or separate hole is first used to draw off explosive gases, where this is a problem. Then water is pumped through such hole or holes to saturate the formation to reduce dust suspension and also to cause additional gas migration. The fractured formation facilitates mechanical boring machines and reduces tool wear. The explosives are preferably provided at spaced intervals along a carrier tube with stiffeners to enable the tube to be pushed into the deep hole and with built-in electrical connections and stemming. The carrier for the explosives is preferably plastic and thus does not damage boring tools.

3,650,565

PICK TYPE MINING BIT AND SUPPORT BLOCK THEREFOR

Thomas J. Kniff, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed May 4, 1970, Ser. No. 34,249
Int. Cl. E21c *35/18*
U.S. Cl. 299—86 **7 Claims**



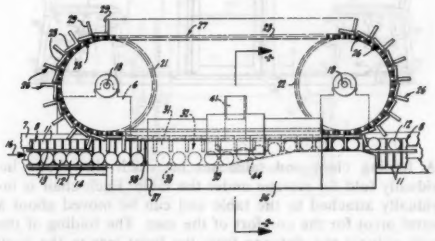
The specification discloses a heavy duty pick type mining bit and a support block therefor in which the block has a bore completely therethrough with a shoulder intermediate the ends of the bore and the pick type tool or bit is shaped to conform to the bore in the block and to take a seat on the shoulder therein and is retained in the block by retaining rings on the small end of the pick outside the block.

3,650,566

MACHINE FOR ARRANGING CANS IN POSITION

Richard G. Lee, Carmel Valley; Allen K. Schleicher, Carmel; Max L. Panzer, and John E. Brock, both of Pebble Beach, all of Calif., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 24, 1969, Ser. No. 869,026
Int. Cl. B60t *13/18*
U.S. Cl. 302—11 **11 Claims**



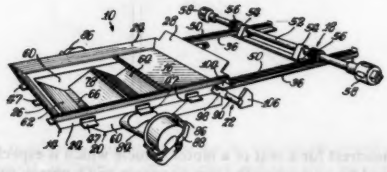
A machine for arranging cans or comparable objects in position has a first conveyor frictionally supporting round cans from the bottom. The first conveyor forms the bottom wall of a tunnel a side wall of which is a second, faster conveyor having partition walls extending partly across the tunnel and defining can receiving pockets. The tunnel is partly evacuated and air flows in through the tunnel portal. A can on the first conveyor, advancing at random, arrives at the portal and when opposite an advancing partition substantially blocks air ingress. Differential air pressure on the can accelerates the can toward the next advanced pocket. Movement of the accelerated can reduces air pressure and affects the air flow so as to tend to hold the can in registry with the pocket. As the can advances, it is also moved laterally into the pocket by transverse air flow or by a converging tunnel wall or both. The pocketed can emerges from the tunnel to the atmosphere in an appropriate position.

3,650,567

HOPPER OUTLET ASSEMBLY

Worrel M. Danielson, Clawson, Mich., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed Nov. 14, 1969, Ser. No. 876,676
Int. Cl. B65g *53/40*
U.S. Cl. 302—52 **1 Claim**



A hopper outlet assembly with a frame defining a discharge opening, a slidable gate, a slidable plenum

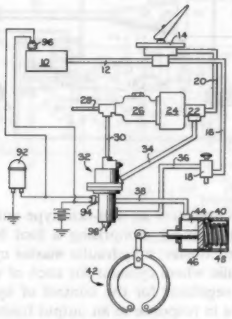
chamber, and control latch means carried by the plenum chamber. The control latch means is selectively engageable either with the frame for holding the plenum chamber across the discharge opening or with the gate whereby conjoint movement of the gate and plenum chamber may be effected.

3,650,568

AIR-OVER HYDRAULIC BRAKE SYSTEM

Eugene M. Poplawski, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 29, 1970, Ser. No. 32,812
Int. Cl. B60t *13/22*
U.S. Cl. 303—2 **6 Claims**



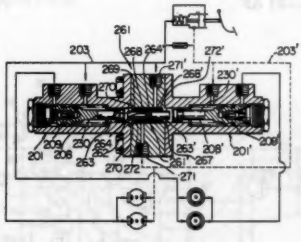
A vehicle having pressure actuated service brakes and a pressure releasable emergency brake system is provided with interrelated controls such that the emergency brake is automatically actuated by the service brake controls when a failure occurs in the service brake system.

3,650,569

BRAKE REGULATOR FOR AUTOMOTIVE VEHICLE

Tsuneo Kawabe; Hirotaka Miyake; Shinji Kawai, and Masasi Ban, all of Kariya City, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed July 1, 1969, Ser. No. 838,123
Claims priority, application Japan, July 5, 1968, 43/46484; Aug. 20, 1968, 43/59457
Int. Cl. B60t *8/26, 11/34, 17/18*
U.S. Cl. 303—6 **5 Claims**



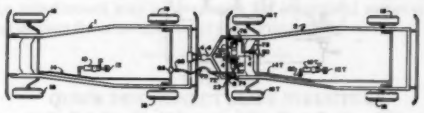
A pressure control valve for motor-vehicle fluid brake system having a control means responsive to an accidentally decreased fluid pressure to change a restoring force of the valve device which is normally responsive to a predetermined fluid pressure force whereby accidentally decreased braking force caused by breakage of another brake system can be supplemented by an application of an additional force to the brake pedal.

3,650,570

HYDRAULICALLY ACTUATED BRAKING SYSTEM FOR UNITARY CONTROL OF DRIVEN AND TOWED VEHICLES

Walter Melvin Meeks, Henrietta, Tex., assignor to Wayland D. Keith and Leverne E. Mangel, Wichita Falls, Tex.

Filed Jan. 12, 1970, Ser. No. 2,044
Int. Cl. B60t *7/00*
U.S. Cl. 303—7 **8 Claims**



A hydraulically actuated braking system to enable the interconnecting of a driven and a towed vehicle, whereby the hydraulic fluid conduit of the driven vehicle is connected in fluid communication to a cylinder-plunger assembly by a flexible conduit, which cylinder-plunger assembly may be connected in end to end relation with an auxiliary master cylinder mounted on the towed vehicle. The auxiliary master cylinder is connected in fluid communication with the hydraulic fluid conduit system which leads to the brakes of the towed vehicle, and, by closing a valve intermediate the conduit system and the normal master cylinder of the towed vehicle, and opening a valve in a conduit intermediate the auxiliary master cylinder and the hydraulic fluid conduit system of the towed vehicle, mechanical force may be applied by the plunger of the hydraulic fluid cylinder-plunger assembly to the auxiliary master cylinder. The cylinder-plunger assembly is connected in fluid communication with the hydraulic fluid brake system of the driven vehicle, and the driven vehicle and the towed vehicle may be accurately controlled simultaneously by the application of the brake pedal of the driven vehicle. Provision is made to close a valve in a conduit intermediate the auxiliary cylinder and the conduit system of the towed vehicle, and opening a valve in the conduit leading from the original master cylinder to the conduit system of the towed vehicle, to enable the towed vehicle to be used in the same manner as if the auxiliary hydraulic cylinder arrangement was not installed thereon. It is to be pointed out that the separation of the hydraulic cylinder-plunger assembly from the auxiliary master cylinder may be accomplished without loss of hydraulic fluid.

3,650,571

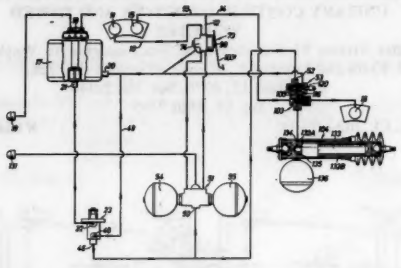
FLUID PRESSURE BRAKING SYSTEMS

Leslie C. Choulings, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England

Filed Sept. 22, 1969, Ser. No. 859,716
Claims priority, application Great Britain, Sept. 23, 1968, 45,124/68
Int. Cl. B60t *13/14*
U.S. Cl. 303—10 **13 Claims**

In a liquid pressure braking system having two separate conduit systems through which liquid under pressure is fed to separate motor cylinders for applying brakes to a wheel of a motor vehicle by operation of a driver operable control valve, and wherein a liquid accumulator is provided in each system, the two accumulators being supplied with liquid

under pressure through a corresponding nonreturn valve by a continuously operable pump, a pressure control valve is provided in the conduit system leading to a motor cylinder operating brakes on a rear wheel of the vehicle, the pressure



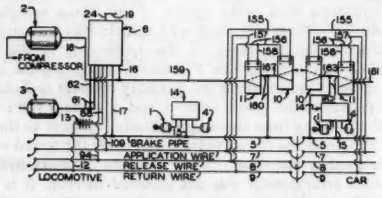
control valve being operated in response to changes in the vertical position of the vehicle's body relative to the wheels to control the pressure of liquid supplied to that motor cylinder in relation to the loading of the vehicle.

3,650,572

PNEUMATIC-ELECTRIC SELF-LAPPING CONTROL APPARATUS

Glenn T. McClure, McKeesport, and Robert B. Salton, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 5, 1970, Ser. No. 765
Int. Cl. B60t *13/66*
U.S. Cl. 303—15 **30 Claims**



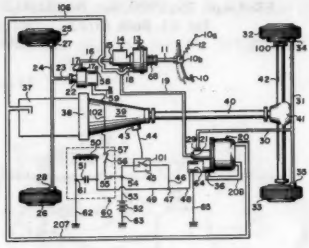
This invention relates to an electro-pneumatic self-lapping unit of a brake valve for use on a railway locomotive to effect control of the pressure in a train line pipe by effecting appropriate energization and deenergization of release and application magnet valve devices provided on the locomotive and each car in a train for supplying fluid under pressure locally to the train line pipe and releasing fluid under pressure therefrom. The energization and deenergization of these magnet valve devices is controlled via train wires by mechanically actuated switches selectively operated substantially simultaneously with the self-lapping unit on the locomotive to supply fluid under pressure to or release fluid under pressure from the train line pipe in response to the engineer effecting manual rotation of a handle mounted on the same shaft as a cam the rotation of which controls operation of the self-lapping unit.

3,650,573

ANTISKID BRAKE ASSEMBLY

Masmai Inada; Tatsuo Hayashi, and Katuki Takayama, all of Kariya-shi, Japan, assignors to Aisin Seiki Company Limited

Filed Mar. 24, 1969, Ser. No. 809,853
Claims priority, application Japan, Mar. 22, 1968, 43/18673
Int. Cl. B60t *8/04, 8/22, 8/26*
U.S. Cl. 303—21 F **8 Claims**



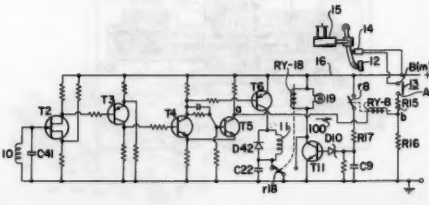
This invention concerns an anti-skid type automotive vehicle wheel brake cylinder comprising a foot brake pedal, a pneumatic brake booster, a hydraulic master cylinder, a skid sensor, a hydraulic wheel cylinder for each of vehicle wheels and a pressure regulator for the control of hydraulic wheel cylinder pressure in response to an output from said skid sensor. The brake arrangement according to the present invention means are provided for making a selected pair, preferably the rear pair, of the vehicle wheels more liable to invite a skid of the selected wheel pair than the remaining wheels, preferably front wheel pair. The brake boosters is controlled in response to an output skid signal from said skid sensor in the skid suppressing sense and a cut-off valve is provided for the wheel brake cylinders for the remaining vehicle wheels, said cut-off valve being operated for cutting off the hydraulic pressure delivered from said master cylinder to the latter wheel brake cylinders in response to the skid output signal from said skid sensor.

3,650,574

AUTOMOTIVE ANTISKID DEVICE WITH SAFETY APPARATUS

Toshiaki Okamoto; Masami Inada, and Koziro Mori, all of Toyota-shi, Japan, assignors to Aisin Seiki Company Limited, Toyota-shi, Aichi-ken, Japan

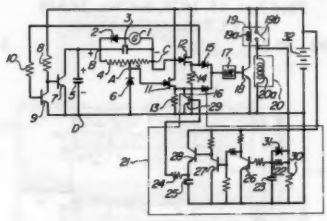
Filed Dec. 31, 1969, Ser. No. 889,575
Int. Cl. B60t *8/00*
U.S. Cl. 303—21 AF **19 Claims**



An apparatus for performing antiskid brake pressure control operation characterized by the provision of an alarm ap-

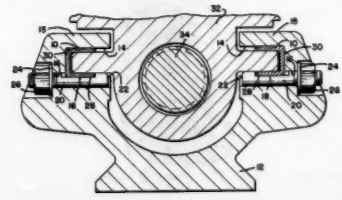
paratus adapted for ignition upon reception of a brake pressure-reducing instruction signal extending beyond a predetermined period.

3,650,575
ANTISKID DEVICE
Atutoshi Okamoto, Toyohashi, Japan, assignor to Nippondenso Kabushiki Kaisha, Showa-cho, Kariya-shi, Aichi-ken, Japan
Filed Apr. 13, 1970, Ser. No. 27,831
Claims priority, application Japan, Apr. 14, 1969, 44/28817
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 CF **9 Claims**



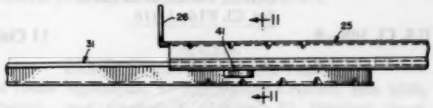
An anti-skid device for automobiles comprising apparatus for converting the wheel speed into a DC voltage, apparatus for producing from the output of said converter a first wheel speed voltage and a second wheel speed voltage higher than said first wheel speed voltage, a capacitor adapted to be charged by said first wheel speed voltage, a discharging circuit for discharging the charge in said capacitor with a time constant corresponding to a preset reference wheel speed, a braking force release unit, switch apparatus for controlling the operation of said braking force release unit, an actuating apparatus consisting of a voltage comparator circuit and an amplifier circuit for actuating said switch apparatus, and a pulse generating circuit for producing pulses to control the actuating apparatus.

3,650,576
LINER FOR ALUMINUM DRILL GUIDE FEED
Robert W. Hughes, Easton, Pa., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Nov. 20, 1970, Ser. No. 91,412
Int. Cl. F16c *29/00*
U.S. Cl. 308—3 A **2 Claims**



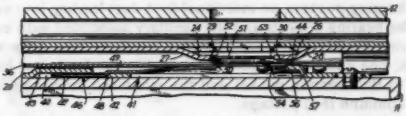
A replaceable wear resistant liner for the wearing surface of an aluminum guide feed used on rock drills.

3,650,577
DRAWER SLIDE ASSEMBLY
Kenneth H. Gutner, 3285 Dato, Highland Park, Ill.
Filed May 28, 1970, Ser. No. 41,190
Int. Cl. F16c *29/00*
U.S. Cl. 308—3.6 **4 Claims**



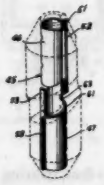
A slide and guide assembly for a drawer made up of two elongated nestable metal members, the metal members being channel shaped and equipped with interfering detents to prevent inadvertent disengagement of the two members, but wherein the members are so constructed and arranged that the interference may be overcome for intentional removal of the drawer from its associated supporting structure.

3,650,578
QUICK DISCONNECT SLIDE STRUCTURE
Joseph T. Del Vecchio, Manuet; John Howell, New City, and Herbert A. Bunin, Tappan, all of N.Y., assignors to Instrument Systems Corporation, West Nyack, N.Y.
Filed Sept. 10, 1969, Ser. No. 856,738
Int. Cl. F16c *21/00*
U.S. Cl. 308—3.8 **11 Claims**



A slide structure comprises a pair of slide members intercoupled by a slide-bearing assembly for longitudinal relative movement between contracted-retracted positions and advanced-extended, and separated positions. A resilient arm is carried by one of the slide members and releasably engages a shoulder on the other slide member when the members are in an intermediate position. The arm is movable to a retained retracted disengaged position, when the slide members are in their intermediate positions, by being longitudinally forwardly slideable along its slide member, or is releasably locked in such position by a slideable lock member and is released from its retracted position upon a predetermined movement of the slide member. The bearing assembly upon extension of the slide member is locked against rearward movement and is released upon a predetermined contraction of the slide members.

3,650,579
SUCKER ROD GUIDE
Donald E. Sable, 4413 Windsor Pr., Dallas, Tex.
Filed July 14, 1970, Ser. No. 54,746
Int. Cl. F16c *29/00*
U.S. Cl. 308—4 A **4 Claims**



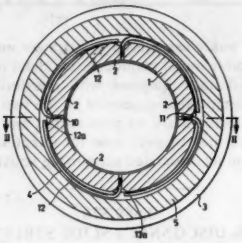
A sucker rod guide having a resilient body and a spring clip embedded in the body for exerting a clamping force on the sucker rod on which the guide is mounted.

3,650,580

HYDROSTATIC BEARING

Heinz Beisemann, Monchengladbach, Germany, assignor to P. Konings Machinefabriek, Ijzer-en Metaalgieterij N.V.

Filed June 10, 1970, Ser. No. 45,033
Claims priority, application Germany, June 14, 1969, P 19 30 376.5; Oct. 22, 1969, P 19 53 160.3
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 11 Claims



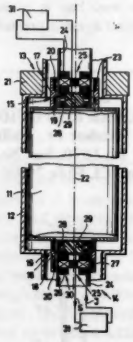
In a hydrostatic bearing comprising a bearing unit having a friction face, bearing pockets in the friction face, means for feeding pressurized liquid into the pockets and a capillary associated with each pocket to act as a hydraulic resistance: the improvement of a common feed passage for a plurality of the bearing pockets, an individual feed duct leading into each of the bearing pockets and the capillary associated with each bearing pocket is in the form of a capillary tube have two ends, one end being sealingly secured in the feed duct leading to that bearing pocket and the other end extending into the common feed passage.

3,650,581

BEARING SYSTEMS

Karl Boden, Oberteuringen, and Dietrich Scheffer, Friedrichshafen, both of Germany, assignors to Karl Boden, Wilhelm Groth & Dietrich Scheffer

Filed Apr. 9, 1970, Ser. No. 27,006
Claims priority, application Germany, June 30, 1969, P 19 33 031.5
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 36 Claims



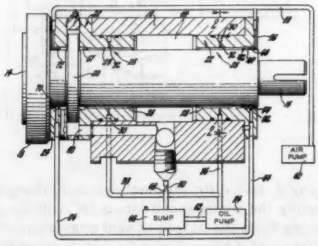
A mechanical contact-free bearing system for a rotor, e.g., in a vacuum pump operating on the Holweck principle, rotatable at high speed comprises a magnetic system which includes at least one carrier magnet for suspending the rotor with its axis vertical. The bearing system includes at least one stabilizing device for counteracting and damping gyratory movements, e.g., procession and nutation, of the rotor. The stabilizing device includes sensors for producing signals responsively to deviation of the axis of the rotor from a predetermined position. An electronic control device amplifies the sensor signals and advances them in phase to produce output signals. Electromagnetic means utilize such output signals to apply electromagnetic forces to the rotor to apply correcting lateral forces to the rotor and further forces to anticipate the gyratory effect of such correcting forces and to damp oscillations of the rotor.

3,650,582

HYDRO-STATIC BEARING AIR SEAL

Richard H. Casey, Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1970, Ser. No. 28,849
Int. Cl. F16c *33/72*, *17/16*
U.S. Cl. 308—36.3 3 Claims



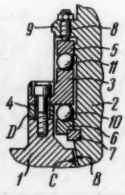
A machine tool spindle having a rotor supported on an externally pressurized liquid film oil bearing is provided with air seals. The air seals comprise annular grooves adjacent the outboards on the spindle which are fed air under pressure. An intermediate groove is provided to limit the aeration of oil to a small portion of oil which overflows from the oil bearing exhaust groove thereby improving pump efficiency and bearing stiffness.

3,650,583

ANTIFRICTION THRUST BEARING OF A ROTARY TABLE

Artur Markovich Itin, ulitsa Gertsena 9/2, kv. 35; Jury Mikhailovich Zhed, Leninsky prospekt, 85 kv. 13, and Vladimir Lvovich Nazarov, 5 Verkhne-Mikhailovsky proezd, 32, kv. 29, all of Moscow, U.S.S.R.

Filed Nov. 24, 1970, Ser. No. 92,384
Int. Cl. F16c *19/10*
U.S. Cl. 308—230 1 Claim



An antifriction thrust bearing for a rotary table is constituted by a double-row bearing having an intermediate race rigidly connected through dimensioned inserts with a portion of the rotary table which is uppermost when in the working

position, while the outer or upper and lower races are mounted on the lathe pillar relative to which the table rotates, with the upper race being capable of an axial displacement in a direction towards the lower race.

The invention can be most effectively used in vertical multi-spindle lathes.

3,650,584

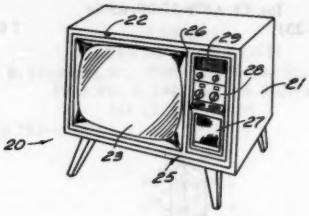
TELEVISION CABINET FACE ASSEMBLY

Frederick J. Goetz, Jr., Arlington Heights, and Emanuel F. Piazza, Addison, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 23, 1970, Ser. No. 92,036

Int. Cl. A47b *81/06*

U.S. Cl. 312—7 TV **12 Claims**



A removable bezel member having integrally formed connector means thereon mounts on the front viewing face of a cabinet for a television receiver with a simple plug-in type connection. A front-mountable escutcheon member has a removable grille member and a removable pivotable door which mount within openings therein with simple snap-in type connections, said bezel, escutcheon and grille members and said door comprising an attachable face assembly for the cabinet to complete and complement the aesthetic appearance of the front face of said television cabinet.

3,650,585

APPARATUS FOR OFFERING GOODS FOR SALE AND FOR DISPENSING SUCH GOODS

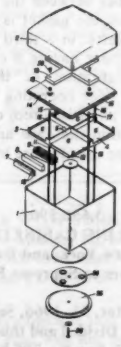
Hermann Hirsch, Klagenfurt, Austria, assignor to Firma Hans Hirsch & Sohne, Klagenfurt, Austria

Filed Dec. 29, 1969, Ser. No. 888,471

Claims priority, application Austria, Oct. 6, 1969, 9407/69

Int. Cl. A47f *1/00*

U.S. Cl. 312—71 **7 Claims**



A plurality of superimposed trays for containing goods are held together by clamp screw means. A base part is connected to the lowermost of said trays and a top part covers the uppermost of said trays. Spring-loaded plungers are adapted to engage said goods in respective trays and urge them in a predetermined direction. Each of said trays defines at least one opening which is arranged to permit of a withdrawal of said goods from said tray in a direction that is transverse to said predetermined direction.

3,650,586

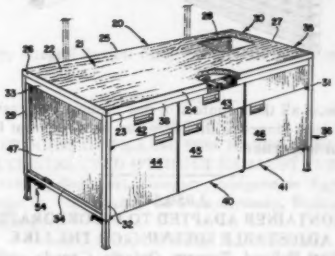
LABORATORY BENCH OR TABLE

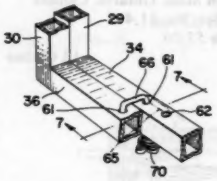
Paul Leslie Nightingale, 51 Hurlingham Crescent, Don Mills, Ontario, and Garnet H. Quigley, 82 Bideford Road, Downsview, Ontario, both of Canada

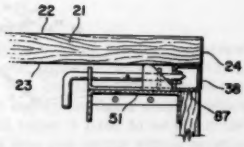
Filed Apr. 2, 1970, Ser. No. 25,145

Int. Cl. A47b *47/00, 47/04*

U.S. Cl. 312—195 **11 Claims**







A modular laboratory bench apparatus adapted to support one or more storage units under the bench, and comprising: a pair of rigid end frame units; a top bench member having front and rear edges and side edges; front and rear channel bars attached to said top member at said front and rear edges; and connecting means for independently interconnecting each end of said channel bars to its respective adjacent end frame unit at the upper portion thereof.

3,650,587

RACK FOR COUNTERS

Arne Sven Hansen, Farsta, and Walter Emil Pegert, Skarholmen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 6, 1970, Ser. No. 25,853

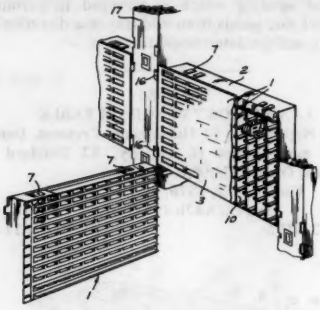
Claims priority, application Sweden, Apr. 25, 1969, 5886/69

Int. Cl. A47b *53/00, 77/00;* A47f *3/00*

U.S. Cl. 312—198 **5 Claims**

Rack for holding a plurality of counters in rows and columns. The rack comprises a number of casings, each with a rectangular bottom part divided into compartments the construction of which is made in such a way that it facilitates

an easy pushing-in of a counter into a compartment. A single lid provided with window-openings for reading of the counters protects all the counters in one casing. The casings are provided with hinges so that they can be swung out for connection or inspection.



3,650,588

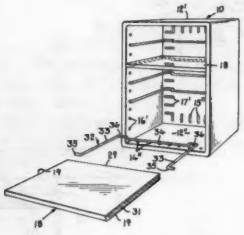
CONTAINER ADAPTED TO INCORPORATE ADJUSTABLE SHELVING OR THE LIKE

Russell Earl Helland, Toronto, Ontario, Canada, assignor to Cameron-McIndoo Limited, Don Mills, Ontario, Canada

Filed July 1, 1970, Ser. No. 51,498

Int. Cl. A47b *57/06*

U.S. Cl. 312—306 **12 Claims**



A container having a base wall and a plurality of upstanding side walls, each side wall being substantially parallel to an opposed side wall of the plurality thereof. The inner face of each side wall is provided with a row of spaced holes, and a row of spaced slots is provided in the inner face of the base wall adjacent to each of the side walls, each hole being in alignment in a direction substantially at right angles to the plane of the side wall in which it is provided with one of the holes in the opposed side wall, and each slot being in alignment in a direction substantially at right angles to the plane of the side wall adjacent to which it is provided with one of the slots of the row of slots adjacent to the opposed side wall. Thus, there is a first series of holes and slots comprising the holes provided in an opposed pair of the side walls and the slots provided in the base wall adjacent to these side walls, and one or more further series of holes and slots, each of which comprises the holes provided in a further pair of opposed side walls together with the slots formed in the base wall adjacent to theses latter side walls, thereby permitting the container to be used with a shelf or divider structure adjustably mounted with portions thereof, or portions of an intermediate support on which the shelf or divider structure is in turn mounted, supportedly engaged with aligned holes and aligned slots of the first series thereof, or alternatively with a shelf or divider structure adjustably mounted with portions thereof, or portions of an intermediate support on which this shelf or divider structure is in turn mounted, supportedly engaged with the aligned holes and aligned slots of the other, or one of the other series thereof. In this manner, a shelf or divider structure can be adjustably mounted within the container in a first direction relative to the container, and a further shelf or divider structure can alternatively be adjustably mounted within the container in a different direction relative to the container, thereby considerably increasing the versatility and hence the usefulness of the container.

3,650,589

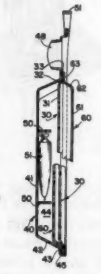
ARTIST PALETTE AND CARRYING CASE

Harrison K. Linger, 7412 Springvale Drive, Louisville, Ky.

Filed Oct. 15, 1969, Ser. No. 866,471

Int. Cl. A47b *27/00, 63/04*

U.S. Cl. 312—231 **7 Claims**



There is disclosed a combination artist's palette and carrying case therefor. The palette includes a generally planar body portion and a peripheral edge portion with at least one side of the body portion being adapted to receive materials thereon for use by the associated artist. A case for the palette is provided, the case having a bottom wall and a side wall and is dimensioned such that the palette fits within the peripheral side wall of the case whereby the case is adapted to receive the palette for use, storage and transportation. Resilient sealing gasket means movable relative to the case also is provided. The gasket means is positionable between the case and the palette and biasing means are provided on the case to cause the palette to compress the gasket and provide a substantially airtight chamber between the palette and the case. In a second embodiment the gasket is rigidly affixed to the edge portion of the palette. in a third embodiment there is provided a disposable liner having a configuration complementary to the configuration of the palette with the peripheral edge of the liner operating as the gasket means. Also, there is provided an artist's tool conditioning structure that may be stored within the case and can be detachably secured to the side of the case for use by the artist.

3,650,590

FILING CABINETS

Martin B. Frederick, New York, and David Sobel, Oceanside, both of N.Y., assignors to Supreme Equipment & Systems Corp.

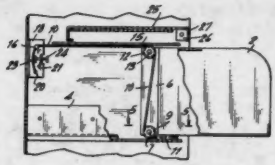
Original application Mar. 31, 1966, Ser. No. 539,103, now Patent No. 3,378,321. Divided and this application Oct. 30, 1967, Ser. No. 705,870

Int. Cl. A47c *88/00;* **A47b** *81/00;* **A47c** *95/00*

U.S. Cl. 312—319 **5 Claims**

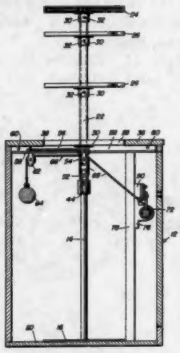
A filing cabinet having a slidably mounted tray and a cable having one end attached to the cabinet. A pair of vertically

spaced pulleys are provided on the rear of the tray. The cable passes first over the pulleys and then through a bracket on



the cabinet and the other end of the cable is anchored to the bracket.

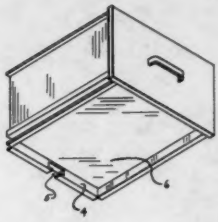
3,650,591
ELEVATOR SHELF UNIT
Ernest B. Longmire, Sr., 2505 South Rowell St., Mobile, Ala.
Filed Apr. 8, 1970, Ser. No. 26,716
Int. Cl. A47b *57/06*
U.S. Cl. 312—312 **2 Claims**



This elevator shelf unit is used in combination with a cabinet. It consists of a plurality of vertically spaced apart shelves rotatably mounted on a sleeve telescopically liftable on an upstanding rod on a base on the floor of the cabinet, the shelves being extendable through an opening in the top of the cabinet. A winch, rotatable by a crank handle through a side of the cabinet, operates a cable and pulley system for lifting the shelves, and a latch near the crank handle serves to hold the shelves in a desired elevated position. A counterweight system is optionally provided for use with heavy shelf loads. It may be used as concealable liquor shelves, or other household needs, for example, with a bathroom cabinet for toilet articles, with a kitchen cabinet for spices and other cooking essentials, etc.

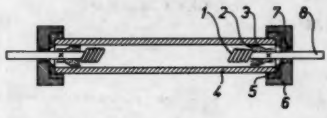
3,650,592
DRAWER WITH GUIDE SYSTEM
Cole C. Williams, 2408 Allanjay Pl., Glendale, Calif.
Filed Dec. 23, 1968, Ser. No. 786,032
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **8 Claims**

A drawer with a thermoplastic rear wall connected to sides of the drawer, which rear wall has integral friction resistant guide means adapted to slidingly engage a wooden rail of a cabinet to align the drawer as it slides in and out of the cabinet. The thermoplastic rear wall is part of a thermoplastic panel, which panel has indicia to show where the panel is to be properly folded to form a drawer of a specified width and length with a thermoplastic rear wall and two sides



joined by integral flexible hinge portions of the thermoplastic panel.

3,650,593
PROCESS OF FILLING DISCHARGE TUBES CONSTRUCTED WITHOUT EXHAUST TUBE
Bela Kerekes, Budapest, Hungary, assignor to Egyesult Izzolampa es Villamossagi Reszvenytarsasag, Budapest, Upjert, Hungary
Filed Oct. 21, 1969, Ser. No. 868,116
Claims priority, application Hungary, Nov. 22, 1968, EE 1596
Int. Cl. H01j *9/18, 9/38*
U.S. Cl. 316—4 **5 Claims**

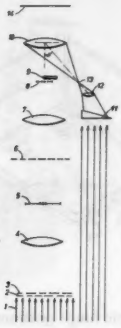


The process relates to filling exhaust tubeless cylindrical lamp bulbs having no exhaust tubes — so called ceramic lamps or discharge tubes — with discharge substances as well as to the sealing of same. A cup containing a mixture which upon heating liberates metal vapor is fixed to an electrode, the latter one is introduced into and united with a ceramic cup. After this, this whole assembly is introduced into and sealed by means of a glass-like binder to the ceramic bulb which is preferably made of aluminum oxide. The reaction mixture contained in the cup is heated thereafter.

3,650,594
METHOD AND APPARATUS FOR INCREASING THE INFORMATION TRANSMITTING CAPABILITIES OF IMAGE FORMING SYSTEMS
Heinrich Nassenstein, Leverkusen-Steinbuchel, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Feb. 26, 1970, Ser. No. 14,477
Claims priority, application Germany, Mar. 8, 1969, P 19 11 801.5
Int. Cl. G02b *27/22, 5/18*
U.S. Cl. 350—3.5 **27 Claims**

A process for increasing the transmitting information possibilities in connection with image-mapping systems, in which the information is transmitted from the object space to the image space by waves. The process is characterized in that

The spacial frequencies of the structure to be examined are transformed into the range of smaller spacial frequency by



the diffraction of evanesent waves it becomes possible for hitherto inaccessible spacial frequencies to be transformed into the conventional range.

3,650,595

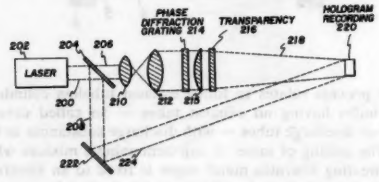
REDUNDANT, SPECKLE-FREE HOLOGRAM RECORDING APPARATUS

Hendrik J. Gerritsen, Providence, R.I., and William J. Hannan, Pennington, N.J., assignors to Radio Corporation of America

Continuation of application Ser. No. 662,822, Aug. 23, 1967, now abandoned. This application Apr. 24, 1970, Ser. No. 29,748

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **10 Claims**



There is disclosed the use of a phase diffraction, rather than a plate of diffusing glass, for introducing redundancy into the information beam which is employed together with a reference beam in recording a hologram. The use of a phase diffraction grating eliminates the presence of unwanted speckle noise in the reproduced image of the hologram, which speckle noise is present to a large degree when a small sized hologram is recorded with a diffused light information beam.

3,650,596

OBJECTIVE INCORPORATING AN IMAGE STABILIZER

Jean Thevenaz, Grandson, Switzerland, assignor to Paillard S.A., Saint-Croix (Vaud), Switzerland

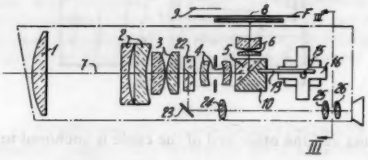
Filed May 13, 1970, Ser. No. 36,866

Claims priority, application Switzerland, June 6, 1969, 8634/69

Int. Cl. G02b *23/00*

U.S. Cl. 350—16 **7 Claims**

An objective chiefly for kinematographic cameras adapted to compensate for untimely shifting of the objective when the camera is held by hand during operation. This compensation is provided by resorting solely to the precession of one or more gyroscopes adapted to rock around an axis with reference to a cage pivotally carried by the objective mount around an axis perpendicular to the axis of the gyroscope, said cage being urged by a spring into a predetermined position and connected with a pivotal optic element incorporated



with the objective in a manner such that any angular movement of the cage produced by the precession of the gyroscope causes the pivoting optic element to be shifted with reference to the objective mount to an extent such as will compensate any sudden modification in the angular setting of the optical axis of the objective.

3,650,597

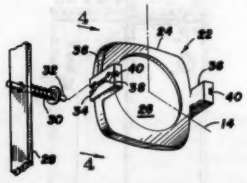
DARKFIELD CONVERTIBLE SUBSTAGE MIRROR

Paul E. Nothnagle, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed June 24, 1970, Ser. No. 49,454

Int. Cl. G02b *21/06*

U.S. Cl. 350—87 **1 Claim**



A substage mirror for illuminating a microscope is equipped with alternate mounting cavities for laterally displacing the mirror off the optical axis and tilting the mirror so as to direct a light beam through the subject but away from the objective, thereby providing darkfield illumination.

3,650,598

LIGHT-CONDUCTING GLASS STRUCTURE HAVING A PERIPHERAL LIGHT-ABSORBENT LAYER

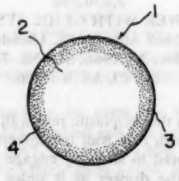
Ichiro Kitano, Kobe-shi; Ken Koizumi, Itami-shi; Yoshiro Ikeda, Nishinomiya-shi, and Hiroyoshi Matsumura, Osaka-shi, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha (a/k/a Nippon Selfoc Co., Ltd.), Tokyo-to, Japan

Filed Sept. 29, 1969, Ser. No. 861,897

Claims priority, application Japan, Oct. 1, 1968, 43/71721

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 R **1 Claim**



A transparent glass body having a light-focusing effect and a refractive index decreasing progressively from its centerline

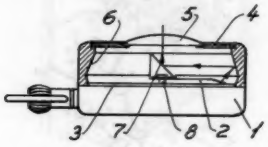
outward and containing readily reducible metal oxides in at least the outer peripheral part thereof is caused to contact a gas having a reducing effect thereby to reduce the metal oxides and form a light-absorbent layer of metal colloid in the outer peripheral part.

3,650,599

MEASURING INSTRUMENT AND READING DEVICE ASSEMBLY

Carl Pedersen, Morsovej 8 B, DK-2720 Vanlose, Denmark

Filed Jan. 28, 1971, Ser. No. 110,709
Int. Cl. G02b *17/06*
U.S. Cl. 350—113 **1 Claim**



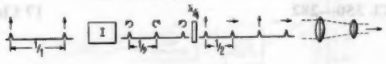
A clock is provided with a curved mirror encircling the scale of the clock, a further mirror is secured to the end of the shaft carrying the pointer of the clock and both mirrors are inclined with respect to the dial of the clock, a magnifying glass is positioned above the mirror secured to the shaft for magnifying the image of the end of the pointer and the section of the scale adjacent the pointer in the actual position thereof, reflected by the mirrors through the magnifying glass.

3,650,600

OPTICAL PULSE DOUBLER UTILIZING SELF-INDUCED TRANSPARENCY

Eric L. Courtens, Adliswil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,349
Claims priority, application Switzerland, Aug. 25, 1969, 12845/69
Int. Cl. G02f *1/22*
U.S. Cl. 350—151 **14 Claims**



Two circularly polarized components, displaced in both time and space, of a polarized light pulse are obtained in an optically resonant medium when the medium operates under the conditions of self-induced transparency. By operating the resonant medium near, but not at, exact resonance and therefor at a position slightly displaced from the absorption resonance line of the medium, application of an axial magnetic field causes an impinging polarized light pulse to be separated into two circularly polarized components.

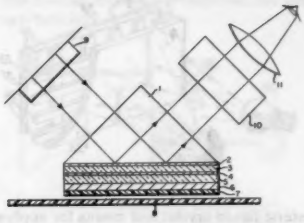
3,650,601

MAGNETO-OPTIC DEVICE HAVING ALTERNATE LAYER FILM STRUCTURE

John David Bierlein, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1970, Ser. No. 91,050
Int. Cl. G02f *1/18*
U.S. Cl. 350—151 **4 Claims**

Kerr magneto-optic transducers having enhanced conversivity can be fabricated using a plurality of thin magnetic mirror layers spaced by dielectric layers having a thickness of



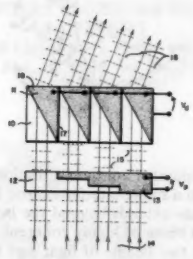
approximately $\mu/4$ where λ is the wavelength of the light employed for readout.

3,650,602

PARALLEL ARRAY LIGHT BEAM DEFLECTOR WITH VARIABLE PHASE PLATE

Tzuo-Chang Lee, Bloomington, and James D. Zook, Burnsville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 19, 1970, Ser. No. 64,980
Int. Cl. G02f *1/34, 1/28*
U.S. Cl. 350—160 R **12 Claims**



The number of resolvable spots produced by a light beam deflection system can be increased by the use of a parallel array of light beam deflectors and a variable phase plate which adjusts the phase of the light entering each of the individual deflectors so that light emerging from the deflectors is co-planar.

3,650,603

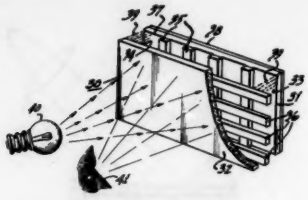
LIQUID CRYSTAL LIGHT VALVE CONTAINING A MIXTURE OF NEMATIC AND CHOLESTERIC MATERIALS IN WHICH THE LIGHT SCATTERING EFFECT IS REDUCED WHEN AN ELECTRIC FIELD IS APPLIED

George H. Heilmeier, Philadelphia, Pa., and Joel E. Goldmacher, Cranbury, N.J., assignors to RCA Corporation

Filed Dec. 5, 1967, Ser. No. 688,123
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 **12 Claims**

A liquid crystal light valve comprises a mixture of at least

one nematic liquid crystal compound of the type that aligns in an electric field, with cholesterol, a cholestrol derivative of



a cholesteric liquid crystal and means for applying an electric field to said mixture.

3,650,604

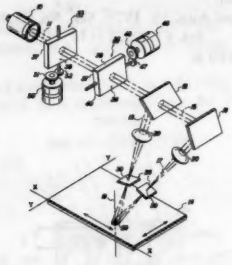
INTERFEROMETRIC SCANNING APPARATUS AND METHOD

William S. Little, Jr,, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1970, Ser. No. 80,878

Int. Cl. G02b *27/00, 17/00*

U.S. Cl. 350—163 **10 Claims**



Method and apparatus are herein disclosed for exposing a recording plane to a stable interferometric line pattern where the recording plane extends beyond the boundary of the exposure pattern. A beam of highly coherent collimated light is split into at least two beams of light and the beams recombined in the recording plane to create an interference pattern of light and dark fringes. At least one flat glass plate is obliquely repositionable in the unsplit light beam and serves to shift the position of the light beam whereby the beam of light leaving the plate is substantially parallel to the light beam entering the plate. This, in effect, causes the illuminated region in the recording plane to be shifted to a new location in the plane without altering the phase relationship of the individual interference fringes. Thus, each bright fringe remains in a stationary position and only changes in intensity as the exposure pattern is moved in the recording plane.

3,650,605

INTERFEROMETRIC APPARATUS WITH CONTROLLED SCANNING MEANS

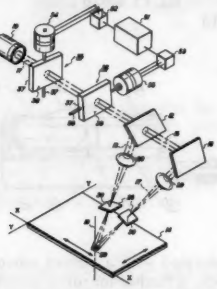
William S. Little, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1970, Ser. No. 80,879

Int. Cl. G02b *27/00, 17/00*

U.S. Cl. 350—163 **11 Claims**

Apparatus is herein disclosed for exposing a recording plane to an interferometric exposure pattern composed of a set of light interference fringes. A beam of highly coherent collimated light is split into at least two beams and the split beams recombined in a recording plane to create an interference pattern of light and dark fringes. At least one flat glass plate is repositionable in the unsplit light beam and serves to shift the position of the light beam whereby the beam of light leaving the plate is substantially parallel to the light beam entering the plate. This, in turn, causes the illu-



minated portion of the recording plane to be shifted to a new location without altering the phase relationship between the various beams at any point in the recording plane. Each bright fringe therefore remains in a stationary position and only changes in intensity as the exposure pattern is scanned in the recording plane. The movement of the plate is programmed so that the illumination is scanned in the recording plane to produce a uniform exposure of the interference fringe pattern.

3,650,606

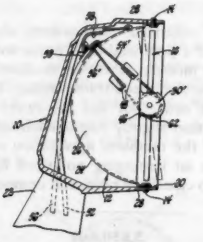
DAY-NIGHT REAR VIEW MIRROR AND REMOTE CONTROLS

Andrew J. Van Noord, Grand Rapids, Mich., assignor to Kent Engineering, Grand Rapids, Mich.

Filed Dec. 4, 1969, Ser. No. 882,204

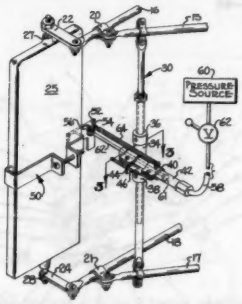
Int. Cl. B60r *1/06;* **G02b** *7/18*

U.S. Cl. 350—282 **17 Claims**



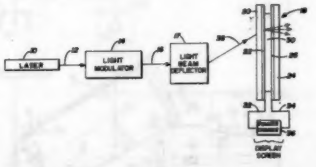
A remote control day-night rear view mirror including a reversible day-night mirror rotatably mounted on a supporting member that is pivoted in a housing shell and which includes control means for turning the mirror over, and for adjusting its viewing disposition about relatively transverse pivotal axes.

3,650,607
REAR VIEWING DEVICE
Albert B. Rogers, 1417 Shannonhouse Drive, Charlotte, N.C., and Arthur N. Rogers, P.O. Box 168, Camilla, Ga.
Filed Aug. 6, 1970, Ser. No. 61,641
Int. Cl. G02b 5/08
U.S. Cl. 350—289 7 Claims



A rear viewing device which is remotely adjustable to permit viewing of a wide area by the operator of a vehicle, and which has provision for automatically returning to its normal viewing position. The device includes a mirror which is mounted for rotation about a vertical axis, and an air control system for rotating the mirror away from its normal position. The control system includes an air cylinder, an adjustable inlet valve for admitting air to the cylinder at a controlled rate, and an air relief passage in the cylinder for exhausting the air therefrom at a controlled rate. A biasing spring is provided to return the mirror to its normal position when the inlet valve is closed and the air has exhausted from the cylinder.

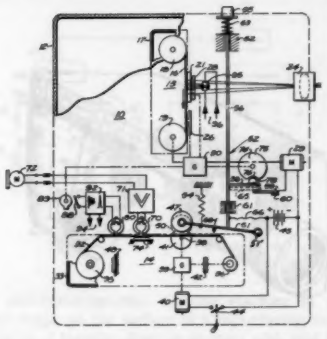
3,650,608
METHOD AND APPARATUS FOR DISPLAYING COHERENT LIGHT IMAGES
Charles E. Baker, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 23, 1969, Ser. No. 887,511
Int. Cl. G03b 21/60
U.S. Cl. 350—320 8 Claims



A method and apparatus for destroying the scintillation or speckling effect observed when a bema of coherent light is impinged or directed upon a stationary screen includes a relatively thin layer of an organic nematic mesomorphic compound which is impressed with a voltage above the particular threshold electric field which causes the compound to scatter light.

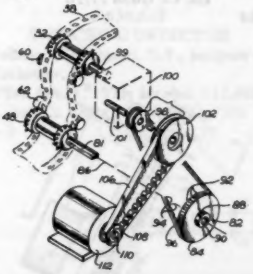
3,650,609
SOUND MOTION PICTURE CAMERA
Joseph H. Lancor, Jr., Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Nov. 3, 1969, Ser. No. 873,330
Int. Cl. G03b 31/04
U.S. Cl. 352—17 15 Claims

A motion picture camera comprises a sound recorder and a control mechanism. The control mechanism becomes operative when a termination of a picture taking and sound recording operation is initiated during the taking of an image frame. In that case the control mechanism defers termination of the picture taking and sound recording operation pending completion of the taking of the particular image frame. The operation of this control mechanism improves the attainable image-sound synchronism.



From another aspect of the disclosure, a mechanism mounted in the camera housing jointly actuates and jointly releases the motion picture taking means and the sound recording means in response to an actuation and to a release, respectively, of a member movably mounted in the camera housing to be manually actuable from the outside thereof.

3,650,610
MOTION PICTURE PROJECTOR SOUNDTRACK MOVEMENT
Charles Ajar, 4265 Clybourn, N. Hollywood, Calif.
Filed Apr. 13, 1970, Ser. No. 27,606
Int. Cl. G03b 31/04
U.S. Cl. 352—31 7 Claims

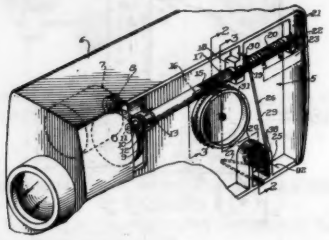


A movement for continuously conducting a soundtrack between continuously rotatable sprocket wheels on opposite sides of a sound transducer, in which the sprockets are mechanically connected to pulleys grooved for and driven by timing belts.

3,650,611
FILM FOOTAGE INDICATOR
Richard K. Carlson, Chicago, and Henry J. Koeber, Deerfield, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Sept. 2, 1969, Ser. No. 854,479
Int. Cl. G03b 1/60
U.S. Cl. 352—172 9 Claims

A film footage indicator for movie cameras including a power source operable to drive a driving worm gear when the

film is being advanced, a driven worm gear having a single row of teeth helically offset on the periphery thereof which are engageable with and driven by the driving worm gear, a pinion gear rigidly mounted on a shaft which is coaxial with but rotatable relative to the driving worm gear and in mesh with and rotated by the driven worm gear teeth, an indicator worm gear rotatable by the pinion gear, a spring indicator flexibly operable to engage the indicator worm gear by inserting a film cartridge into the camera and flexibly operable to be advanced by the rotating indicator worm gear and a marked window in the camera housing located in alignment with the advancement of the spring indicator for indicating the amount of exposed film. Upon removal of the cartridge from the camera, the spring element indicator will automatically disengage from the indicator worm gear and return to the initial (start) position.



3,650,612

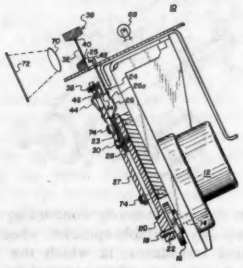
STRIP MARKING ASSEMBLY

Matthew F. Malkiewicz, New Foundland, N.J., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,712

Int. Cl. G03b *21/26*

U.S. Cl. 353—44 **5 Claims**



Apparatus is disclosed for placing marks or indicia on strips of inscribable material such as photographic film. The apparatus includes a motor for providing rotational torque, a stylus with an offset portion for marking the strip, an assembly for converting the rotational torque of the motor into a rectilinear motion and for coupling the rectilinear motion to the stylus, and a bracket having a surface brought into engagement with the offset portion of the stylus to thereby bring the stylus into contact with the strip.

3,650,613

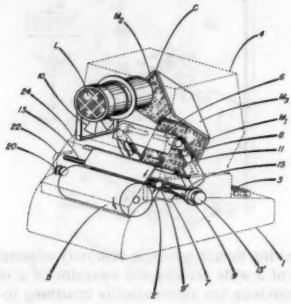
TELETYPEWRITER OPAQUE OPTICAL PROJECTOR AND THE LIKE

Francis Frazier, Cambridge, Mass., and Ralph P. Graeber, Woodland Hills, Calif., assignors to Bolt Beranek and Newman, Inc., Cambridge, Mass.

Filed Feb. 25, 1969, Ser. No. 802,116

Int. Cl. G03b *21/00*

U.S. Cl. 353—46 **9 Claims**



This disclosure deals with an opaque optical projector that is adapted for attachment to real-time data-recording objects, for simultaneous projection of the data thereof without interference with the operation of the recording.

3,650,614

PROJECTOR

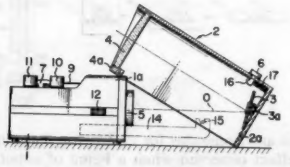
Tsunezo Shimoda; Koji Hikawa; Syuichi Yahata, and Mitsugu Obata, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 8, 1969, Ser. No. 882,958

Claims priority, application Japan, Dec. 12, 1968, 43/108781

Int. Cl. G03b *21/30*

U.S. Cl. 353—72 **4 Claims**

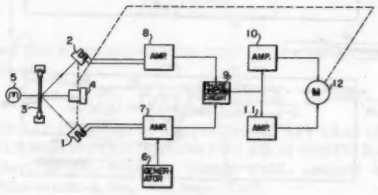


A projector having a main body with a lens therein and a cover body that encloses the main body in closed position. The cover body includes a tilted mirror on one inside end wall and a screen at the other end wall. The cover body can be moved to an open position where the end wall with the tilted mirror is in line with the lens and spaced therefrom while the other end wall is tilted upwardly to rest on the edge of the main body where the lens is mounted. A supporting means in said main body is slidable therefrom to engage an intermediate part of the cover body in the tilted open position.

3,650,615
SONIC FOCUSING SYSTEM FOR PROJECTORS

Chihiro Aoki, Aichi District, and Takashi Hirata, Nagoya, both of Japan, assignors to Elmo Company Limited, Mizuho-ku, Nagoya, Japan

Filed June 22, 1970, Ser. No. 48,337
Int. Cl. G03b 3/00, 21/14; G01s 9/66
U.S. Cl. 353—101 1 Claim

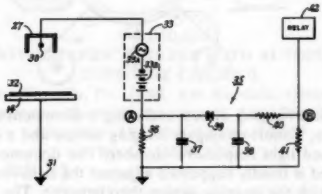


A sonic focusing system utilizes a beam of ultrasonic energy to detect an offset or displacement of a picture carrier to be projected from its initial focused position and is based upon the principle that upon the occurrence of such displacement, a phase difference is created between the ultrasonic waves after and before the occurrence of the displacement and therefore if this phase difference can be converted to a detecting signal for causing a focus control motor to be rotated in a direction causing the displacement of the picture carrier to be compensated, it becomes possible to bring the projection lens in focus automatically.

3,650,616
MISPUFF DETECTOR

Fredrick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,404
Int. Cl. G03g 15/00; B65h 7/06
U.S. Cl. 355—3 7 Claims

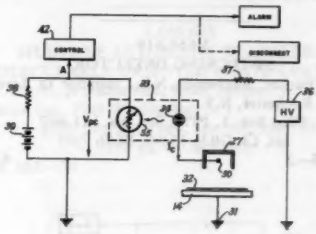


In an electrostatographic copying machine in which a developed image on the surface of a reproducing member is transferred to a transfer sheet in contact with said image, a device is provided for detecting the undesired continued presence of the transfer sheet on the reproducing surface after the image has been transferred, said device including a power source for providing a current flow between an electrode and the reproducing surface at a point beyond the image transfer area and a detecting circuit coupled to the electrode and power source for indicating a change in the current flow caused by the presence of the transfer sheet between the electrode and the surface, thereby indicating continued contact of the transfer sheet with the reproducing surface. The detecting circuit can be used to discontinue the operation of the machine.

3,650,617
SWITCHING DETECTOR

Carlton J. Baxter, Penfield, and S. William Volkers, Williamson, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,405
Int. Cl. G03g 15/00; B65h 7/06
U.S. Cl. 355—3 4 Claims

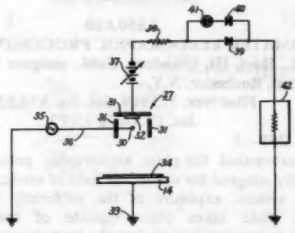


In an electrostatographic copying machine in which a developed image on the surface of a reproducing member is transferred to a transfer sheet in contact with said image, a device is provided for detecting the undesired continued presence of the transfer sheet on the reproducing surface after the image has been transferred, said device including a power source for providing a current flow between an electrode and the reproducing surface at a point beyond the image transfer area and a switching circuit coupled to the electrode and power source for indicating a change in the current flow caused by the presence of the transfer sheet between the electrode and the surface, thereby indicating continued contact of the transfer sheet with the reproducing surface. The switching detector includes a light sealed photodetector light source unit which electrically isolates the current flow portion from the detector portion. The switching circuit can be used to discontinue the operation of the machine.

3,650,618
SWITCHING DETECTOR

Stewart W. Volkers, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,406
Int. Cl. G03g 15/00; B65h 7/06
U.S. Cl. 355—3 5 Claims



In an electrostatographic copying machine in which a developed image on the surface of a reproducing member is transferred to a transfer sheet in contact with said image, a device is provided for detecting the undesired continued presence of the transfer sheet on the reproducing surface after the image has been transferred, said device including a power source for providing a current flow between an elec-

trode and the reproducing surface at a point beyond the image transfer area and a switching circuit coupled to the electrode and power source for indicating a change in the current flow caused by the presence of the transfer sheet between the electrode and the surface, thereby indicating continued contact of the transfer sheet with the reproducing surface. The electrode is part of a corona discharge unit constructed so as to employ an AC potential source for activation. The switching circuit can be used to discontinue the operation of the machine.

3,650,619

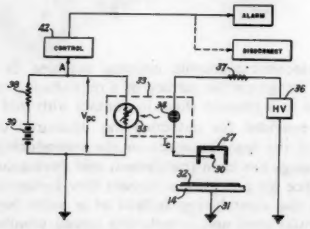
SWITCHING DETECTOR

Delmer G. Parker, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,407

Int. Cl. G03g *15/00;* **B65h** *7/06*

U.S. Cl. 355—3 **6 Claims**



In an electrostatographic copying machine in which a developed image on the surface of a reproducing member is transferred to a transfer sheet in contact with said image, a device is provided for detecting the undesired continued presence of the transfer sheet on the reproducing surface after the image has been transferred, said device including a power source for providing a current flow between an electrode and the reproducing surface at a point beyond the image transfer area and a switching circuit coupled to the electrode and power source for indicating a change in the current flow caused by the presence of the transfer sheet between the electrode and the surface, thereby indicating continued contact of the transfer sheet with the reproducing surface. A charge dissipating device is provided immediately after the transfer point to discharge any residual surface charge patterns and prevent erroneous readings. The switching circuit can be used to discontinue the operation of the machine.

3,650,620

AUTOMATED XEROGRAPHIC PROCESSING SYSTEM

Hazen L. Hoyt, III, Glendora, Calif., assignor to Xerox Corporation, Rochester, N.Y.

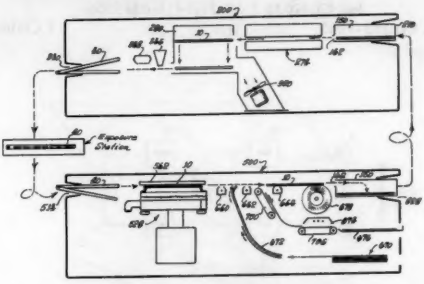
Filed Nov. 7, 1969, Ser. No. 874,834

Int. Cl. G03g *15/22*

U.S. Cl. 355—3 **49 Claims**

An automated flat-plate xerographic processing system especially adapted for use in the field of medical diagnostics. In this system, exposure of the uniformly charged xerographic plate takes place outside of the xerographic processing apparatus such that the test object may be selectively positioned with respect to the radiation source and the xerographic plate. To permit such exposure, the processing system includes a light-tight cassette into which the uniformly charged xerographic plate is inserted and held until automatically withdrawn, after exposure, by the development apparatus.

The charging apparatus includes means for receiving and opening the light-tight cassette, means for inserting the charged xerographic plate therein without disturbing the uniform electrostatic charge thereon and means for closing the cassette. The development apparatus includes means for receiving and opening the cassette without further exposure of the xerographic plate to actinic electromagnetic radiation,



the xerographic plate being held in the proper alignment for removal from the cassette, and means for withdrawing the xerographic plate from the cassette and for advancing the xerographic plate to the development means without disturbing the latent electrostatic image thereon.

3,650,621

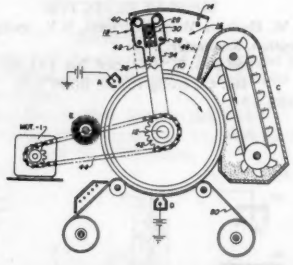
OPTICAL IMAGING SYSTEM

William G. Lewis, Rochester; Robert W. Moorhusen, Penfield, and Richard H. Nagel, Fairfield, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Mar. 28, 1969, Ser. No. 811,561

Int. Cl. G03b *27/50*

U.S. Cl. 355—8 **1 Claim**



An optical imaging system including a document supporting surface, a short conjugate imaging device and a cylindrically shaped light responsive member. The document to be reproduced is fixedly supported adjacent the light responsive member with the imaging device therebetween. The imaging device is moved in the direction opposite the direction of rotation of the light responsive member in an arcuate path concentric with the light responsive member and document supporting surface to thereby create a usable pattern on the surface of the light responsive member in conformity with the document being reproduced.

3,650,622

APPARATUS FOR CONTROL OF BIAS POTENTIAL IN AN ELECTROPHOTOGRAPHIC COPIER

Theodore H. Morse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

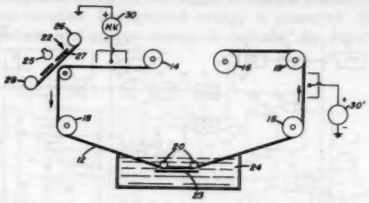
Filed Mar. 9, 1970, Ser. No. 17,394

Int. Cl. G03g *13/10*

U.S. Cl. 355—10 **2 Claims**

An apparatus and method are disclosed for adjusting the

potential difference between the conducting layer and ground at any preselected position on a photoconductive element that is continuous from exposure through development stations.



3,650,623

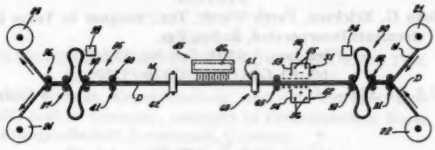
CONTACT PRINTING METHOD AND APPARATUS WITH ELECTROSTATIC MEANS FOR FILM REGISTRATION

Robert Beispel, Westlake Village, Calif., assignor to Extek Microsystems, Inc., Van Nuys, Calif.

Filed Dec. 18, 1969, Ser. No. 886,171

Int. Cl. G03g *15/00*

U.S. Cl. 355—12 **23 Claims**



A method and apparatus for contact printing of continuous strips of film in which the image on the transparent master film is exposed with the light-sensitive negative film while the film strips are in an exposure zone. The film strips are maintained in precise registry through electrostatic devices which produce opposite charges on the two strips, causing them to attract and strongly adhere to one another, thereby preventing relative transverse, lateral and longitudinal movement during exposure. An alternative form of the invention providing for using a master having a substantially smaller width than the duplicate, and printing a plurality of master strips on the duplicate in side-by-side relation.

3,650,624

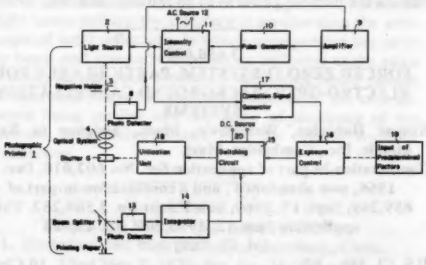
PHOTOGRAPHIC PRINTER WITH AUTOMATIC EXPOSURE CONTROL

Yoshihiro Yamada, No. 2845, Aza Kuroishi, Oaza Hirabari, Tenpaku-cho, Showa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Mar. 13, 1970, Ser. No. 19,407

Int. Cl. G03b *27/76*

U.S. Cl. 355—69 **1 Claim**



Photographic printer is provided with an apparatus for controlling the quantity of printing light to be applied to a printing paper in dependence upon the variable densities of negative film to be printed. Said intensity control apparatus is composed to two photoelectrical devices, namely one for controlling the effective current supplied to a printer lamp and other for controlling other factors influencing the quantity of the printing light. A correction signal is derived from the former device and applied to the latter device, to thereby attain a fine and high speed control of the photographic printing process with proper exposure appropriate for the negative and printing paper as used.

3,650,625

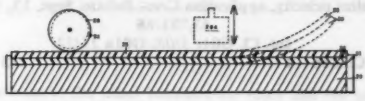
MULTIPLE AUTOMATIC TRANSFER OF MOLECULARLY ORIENTED MOTION PATTERNS

Paul A. Hoyte, Jr., Blue Ash, Ohio, assignor to Technical Animations, Inc., Port Washington, N.Y.

Filed Oct. 31, 1966, Ser. No. 590,789

Int. Cl. G03b *27/02*

U.S. Cl. 355—78 **1 Claim**



1. A method for orienting the surface molecules of a matrix into a motion pattern in the latent state comprising the steps of coating the surface of the matrix with photo resist material, preparing a mask for each vector of orientation desired, each of said masks having at least one portion adapted to permit exposure of all but the selected portions, then placing a first mask over the coating of photo resist exposing the photo resist to light, then washing away the unexposed portions and orienting all unexposed portions in a single vector, then stripping the photo resist from the matrix, then recoating the matrix with photo resist and placing another mask comprising other selected areas, then exposing the photo resist to light and washing away the unexposed portions and orienting the uncovered portions of the matrix in a vector different from the previous vector, and then repeating the foregoing steps for as many vectors as may be desired.

3,650,626

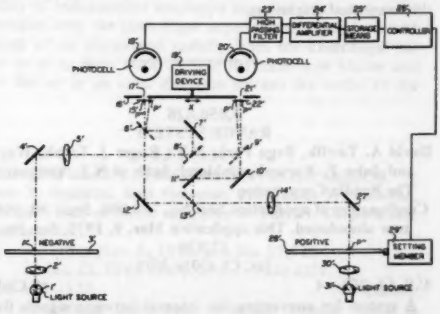
METHOD OF AND APPARATUS FOR THE AUTOMATIC SCANNING OF PARTS OF STEREOGRAMS BY OPTICAL COMPARISON OF THE IMAGES

Otto Hofmann, Kirchstockach, Germany, assignor to Dr. Johannes Heidenhain, Traunreut nr. Traunstein, Germany

Filed Sept. 30, 1968, Ser. No. 763,538

Int. Cl. G01c *11/18*

U.S. Cl. 356—2 **12 Claims**



A method of and apparatus for automatic scanning and spatial measuring of stereo image pairs, which comprises the

steps of feeding together from a stereo image pair identical zones of the positive image of an exposure location and of the negative image of the other exposure location optically into a plane, and displacing the images relatively to each other or jointly by light-electric scanning and a control circuit such, that within the scanning range the light-dark contours disappear and are reduced to a minimum, respectively, the contours are present as a result of parallaxes between the negative and the positive, so that within the scanning range identical scanning spots of the negative and of the positive and a unitary gray tone are created.

3,650,627

MEASUREMENT OF VISUAL RANGE IN FOG

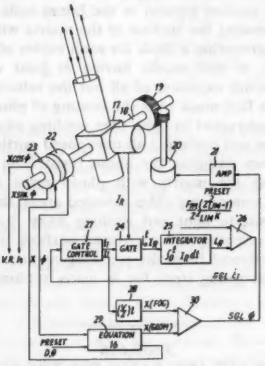
Paul Adelbert Noxon, Tenafly, N.J., assignor to Thorn-Bendix Limited, New Barnet, Hertfordshire, England

Filed Sept. 10, 1969, Ser. No. 856,565

Claims priority, application Great Britain, Sept. 13, 1968, 43,781/68

Int. Cl. G01c *3/08*; **G01n** *21/22*

U.S. Cl. 356—4 **13 Claims**



Apparatus for measuring visual range in fog comprises a transmitter which transmits a pulsed parallel beam of radiation, a receiver which measures the radiation reflected by the fog, and means for integrating the received brightness with respect to time. A measure of the visibility is derived from the integrated brightness.

3,650,628

RANGE SYSTEM

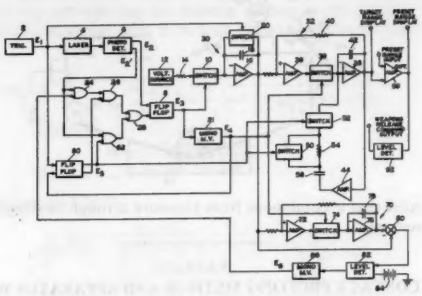
David A. Tawfik, Rego Park, N.Y.; Roger J. Talish, Wayne, and John F. Yurasek, Oakland, both of N.J., assignors to The Bendix Corporation

Continuation of application Ser. No. 763,866, Sept. 30, 1968, now abandoned. This application Mar. 9, 1970, Ser. No. 17,036

Int. Cl. G01c *3/08*

U.S. Cl. 356—4 **9 Claims**

A system for converting the interval between signals fired at a target and corresponding rebound signals therefrom to a full scale target range indicating and to an expanded scale indication showing target range to a preset range point. Means are included for eliminating the effect of missing or false



rebound signals, increasing noise immunization and for initiating a weapons release command.

3,650,629

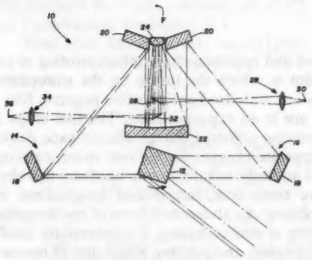
SPLIT IMAGE, DUAL SPECTRUM OPTICAL SCANNING SYSTEM

John G. Erickson, Forth Worth, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 3, 1970, Ser. No. 43,053

Int. Cl. G01j *3/00*; **G02b** *17/00*

U.S. Cl. 356—74 **6 Claims**



A split image, dual spectrum optical scanning system includes a rotating multi-sided mirror for receiving radiant energy and for dividing the energy into split images. The split images are reflected through equal and opposite relay mirror systems to a Cassegrain type optical system, which converges the split images into a narrow envelope. An angularly extending dichroic mirror reflects the ultraviolet/visible portions of the split images out of the envelope to an ultraviolet/visible detector. The dichroic mirror also passes the infrared portions of the split images to an angularly extending mirror that reflects the infrared portions to an infrared detector.

3,650,630

FORCED ZERO SUBSYSTEM, PARTICULARLY FOR ELECTRO-OPTIC BACKGROUND CANCELLATION SYSTEMS

Kaspar Habosian, Watertown, Mass., assignor to Baird-Atomic, Inc., Cambridge, Mass.

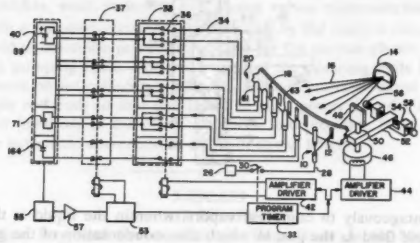
Continuation-in-part of application Ser. No. 602,010, Dec. 15, 1966, now abandoned , and a continuation-in-part of 859,249, Sept. 17, 1969, now Patent No. 3,588,252. This application June 12, 1970, Ser. No. 45,620

Int. Cl. G01j *3/30*

U.S. Cl. 356—82 **10 Claims**

Line spectra and background energy superimposed thereon is alternately positioned "on" and "off" a slit. During the "off" period only background energy is positioned on

the slit. Measuring and reference capacitors associated with photomultipliers, integrate the signal in such a manner that long time constant background energy is canceled. Short time constant background energy is canceled by detecting



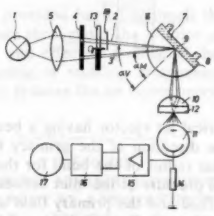
the polarity of the residual charge on the reference capacitor and by integrating, on each measuring capacitor, a signal representing the opposite polarity of the detected charge. In consequence, the residual charge on each of the measuring capacitors is driven to zero.

3,650,631

ARRANGEMENT AND PROCESS FOR MEASURING THE REFRACTIVE INDEX OF LIQUIDS

Joachim Grassel, Krefeld-Bockum, and Otto Petersen, Krefeld, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 30, 1970, Ser. No. 33,452
Claims priority, application Germany, May 13, 1969, P 19 24 311.9
Int. Cl. G01r *21/46*
U.S. Cl. 356—128 **12 Claims**



A two-beam arrangement for measuring the refractive index of liquids using the fact that the intensity of a measuring light beam reflected at an interface between a solid reference body and a sample liquid is governed by the refractive index of the sample liquid when the angle of incidence of the light beam striking the interface is smaller than the critical angle of total reflection, in which arrangement the measuring beam and comparison beam are reflected at the same point along an interface between a measuring liquid sample and a reference body, the angle of incidence of the measuring beam being smaller and the angle of incidence of the comparison beam being greater than the critical angle of total reflection.

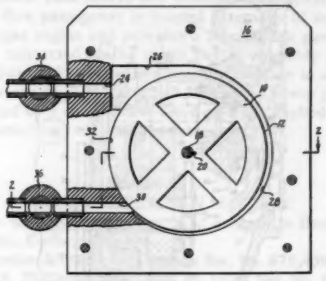
3,650,632

FRICTION DRIVE ROTARY ENGINE

John L. Shanahan, 380 West Main St., Waterbury, Conn.

Filed May 5, 1970, Ser. No. 34,696
Int. Cl. F01d *1/36*
U.S. Cl. 415—90 **4 Claims**

A casing having a circular bore therein, a rotor rotatably mounted within the bore, inlet and exit vents leading to and from the bore, and valves connected to the vents outside the casing for regulating the passage of air or steam travelling



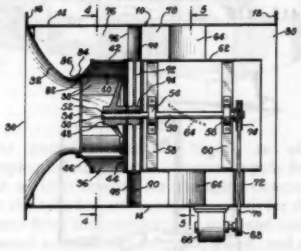
from one vent to the other between the rotor and the inner diameter of the bore.

3,650,633

IN-LINE CENTRIFUGAL FAN

Remi A. Benoit, 27 Pinewood Drive, Neptune, N.J.

Filed Nov. 30, 1970, Ser. No. 93,600
Int. Cl. F04d *25/16, 25/02, 29/40*
U.S. Cl. 415—143 **8 Claims**



In an in-line centrifugal fan having an annular centrifugal impeller mounted for rotation within a tubular housing, a plurality of independent axial-type impeller blades mounted for rotation with the centrifugal impeller and juxtaposed with the path of air discharged radially from the centrifugal impeller so as to draw such air into the axial-type blades and direct the air in an axial direction toward the outlet of the fan.

3,650,634

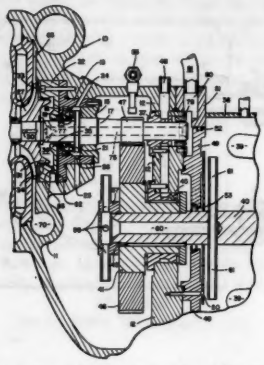
CENTRIFUGAL REFRIGERATION COMPRESSOR

William T. Osborne, East Syracuse, and James W. Endress, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 6, 1970, Ser. No. 87,521
Int. Cl. F04d *29/00, 25/02;* **F16c** *1/24*
U.S. Cl. 415—175 **3 Claims**

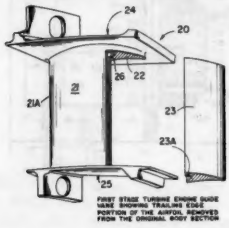
In a centrifugal compressor a sealed annular space is established between the backside of the impeller and the housing wall. Pump means is provided to maintain a minimum pressure in the annular space at a level above the

pressure in the bearing structure mounted in the housing wall. The arrangement prevents the passage of oil from the



bearing structure to the area behind the impeller when the discharge pressure falls to an abnormally low level.

3,650,635
TURBINE VANES
Richard Lloyd Wachtell, Tuxedo Park, and Edward C. Palmenberg, Nanuet, both of N.Y., assignors to Chromalloy American Corporation
Filed Mar. 9, 1970, Ser. No. 17,752
Int. Cl. F01d *5/14*
U.S. Cl. 415—115 **14 Claims**

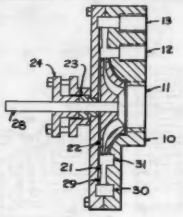


FIRST STAGE TURBINE ENGINE GUIDE VANE SHOWING TRAILING EDGE PORTION OF THE AIRFOIL REMOVED FROM THE ORIGINAL BODY SECTION

An improved airfoil is provided for turbine engines having locating buttresses at opposite ends thereof, said airfoil having a leading edge and a trailing edge. The body of the airfoil section has a polycrystalline structure of equiaxed grains, at least one of the airfoil edges being comprised of a welded insert having grains running longitudinally of said edge.

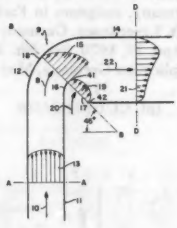
3,650,636
ROTARY GAS COMPRESSOR
Michael Eskell, 2932 Sandage Ave., Fort Worth, Tex.
Filed May 6, 1970, Ser. No. 35,112
Int. Cl. F04b *23/04*
U.S. Cl. 417—78 **2 Claims**

Method and apparatus for a compressor for compressing air, gases and vapors isothermally using a liquid stream to compress the gas; the liquid issuing from an impeller intermittently, with the gas being entrained between these liquid pulses and compressed by the liquid; the liquid having high kinetic energy when leaving the impeller and in slowing the kinetic energy is converted to pressure for both the liquid and entrained gas. Also, this compressor may be used ad-



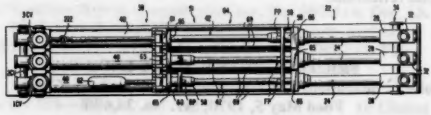
vantageously to compress vapors, wherein the liquid is the same fluid as the gas, in which case condensation of the gas to the liquid occurs, and work of compression is reduced.

3,650,637
ASYMMETRICAL JET EJECTOR
David W. Amick, 6437 Melia St., Springfield, Va.
Filed Apr. 27, 1970, Ser. No. 31,897
Int. Cl. F04f *5/00*
U.S. Cl. 417—151 **5 Claims**



An asymmetrical jet ejector having a bend along the conduit axis in the direction of the primary fluid flow and an inlet at the inner radius of the bend for the secondary fluid. The differential pressure at the inlet between the pressure of the secondary fluid and the primary fluid at the inner radius of the bend produces a flow of the secondary fluid into the conduit. The energy in the primary flow thereby induces and entrains the flow of the secondary fluid.

3,650,638
HYDRAULICALLY POWERED PUMP HAVING A PRECOMPRESSION FUNCTION
Clinton W. Cole, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Dec. 19, 1969, Ser. No. 886,687
Int. Cl. F04b *35/00, 15/02, 17/00*
U.S. Cl. 417—346 **21 Claims**



An hydraulically powered multiplex pump having at least three pumping units, each operable in a cycle including suc-

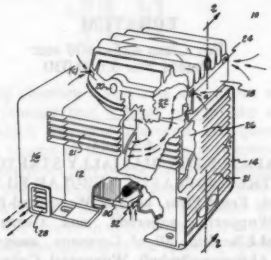
tion, precompression and discharge phases, with the cycles being out of phase with one another, whereby simultaneous performance of these functions results in a substantially constant pressure and flow of both the pumped fluid and the power fluid. Separate power and cycle control circuits, which may employ different fluids, are provided. Control valve assemblies, each including two sleeve valves communicating with a common chamber, are operated by the control circuit fluid to condition power circuit flow for the various phases of the pumping cycle. The power end of the pumping units includes power cylinders which may be fluid interconnected at their rod ends so that operations in each power cylinder affect functions in the other chambers, and provision is made for automatic correction of errors in stroke length.

3,650,639

AIR PUMPS

Robert Raymond Greene, Chicago; Hans Oscar Jacob, Morton Grove, and Meredith Wayne Meece, Niles, all of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,615
Int. Cl. F04b *17/00, 35/00, 39/02, 21/00, 45/00*
U.S. Cl. 417—368 **4 Claims**



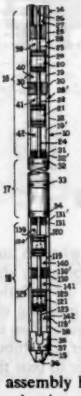
Air pumps are provided having channels therein to allow cool air to circulate throughout the interior of the pump to promote efficient and effective cooling of the pump. Additionally, a dampening or muffling arrangement is provided which substantially reduces the air borne operational noise of the pumps.

3,650,640

DOWNHOLE PUMP ASSEMBLY HAVING ENGINES SPACED APART BY A PRODUCTION PUMP

George K. Roeder, Box 4335, Odessa, Tex.

Filed May 11, 1970, Ser. No. 36,351
Int. Cl. F04b *17/00, 35/00*
U.S. Cl. 417—396 **10 Claims**



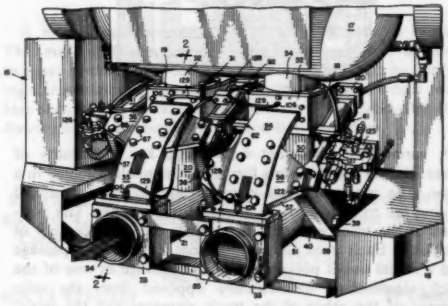
A fluid actuated pump assembly having a valve assembly, an engine means, and a production pump. The engine means is comprised of an upper and lower engine assembly with the pump being interposed therebetween. A flow passageway formed from the valve assembly through an axial passageway in the upper engine assembly, through an axial passageway in the production pump, and to the lower engine assembly provides a power fluid source and exhaust to the lower engine. Another flow passageway is located externally of the piston of the upper engine and provides a second flow passageway which is connected to the upper engine assembly so as to enable power fluid and spent power fluid to flow to and from the upper engine. This expedient causes the pump piston to be actuated by a compressive force which is applied to each of the connecting rods attached thereto.

3,650,641

CONCRETE PUMPING MACHINE

Gerald H. Reinert, Cold Spring, Ky., assignor to Desa Industries, Inc., Cockeysville, Md.

Continuation-in-part of application Ser. No. 875,439, Nov. 10, 1969. This application Aug. 25, 1970, Ser. No. 66,744
Int. Cl. F04b *7/00;* **E03b** *;* **G01f** *11/28*
U.S. Cl. 417—518 **15 Claims**



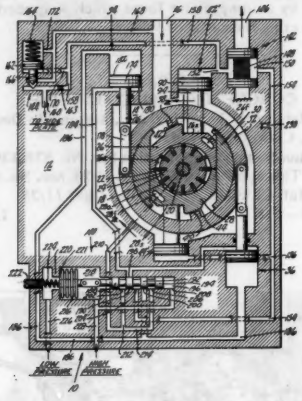
A concrete pumping machine having an elongated concrete pumping cylinder and a concrete supply hopper is provided with an inlet conduit for supplying concrete from the hopper to the cylinder and an outlet conduit for discharging the concrete from the cylinder. The inlet and outlet conduits are disposed substantially perpendicularly, and an arcuate valve blade is pivotally mounted for swinging movement into and out of the flow paths through the inlet and outlet conduits for selectively opening the inlet conduit while closing the outlet conduit and for closing the inlet conduit while opening the outlet conduit. A blade seal housing is mounted on each of the conduits for slidably receiving the swinging valve blade, and each seal housing is provided with an elongated generally rectangular opening through which the blade moves. A sealing gasket and an oil-absorbent felt pad are mounted within each housing adjacent the opening, and a hardened steel liner is positioned in the housing to protect the housing from the moving blade. The blade is mounted for arcuate movement on a pivotally mounted yoke, which is powered by a pair of double-acting hydraulic piston and cylinder assemblies, and the piston of the concrete pumping cylinder is also powered by a double-acting hydraulic piston. Suitable control means are provided for coordinating the movement of the blade-operating pistons with the movement of the pumping piston so that the pumping piston is retracted when the blade closes the outlet conduit and is extended when the blade closes the inlet conduit. The blade-operating cylinders are pivotally interconnected between the swinging yoke and the pump frame, and a hydraulic pilot valve is mounted for movement with the blade-operating cylinder to maintain a substantially constant relationship between the pilot valve and the cylinder.

3,650,642

PUMPING SYSTEM INCLUDING VARIABLE DISPLACEMENT VANE PUMP

John E. Cygnor, Middletown, and Jack G. Sundberg, Meriden, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 14, 1970, Ser. No. 28,446
Int. Cl. F01c *21/16*; F03c *3/00*; F04c *15/04*
U.S. Cl. 418—26 6 Claims



A variable displacement vane pump has a plurality of vanes slidably fitted in slots formed substantially radially in a rotor. The identical track elements are movably arranged around the rotor to provide a track for the vanes. The positions of the track elements determines the displacement of the pump. Each track element includes a radial inlet passage and a radial outlet passage. The inlet passage of one of the track elements is diametrically opposed from the inlet passage of the other of the track elements and the outlet passage of one of the track elements is diametrically opposed from the outlet passage of the other of the track elements in order to pressure balance the rotor. The track elements are slideably mounted within a frame around which is rotatably disposed a cam actuation ring. Cam members are provided on the cam ring to contact respective can surfaces on the track elements and control the position of the track elements with respect to the rotor. The cam ring is rotated about the frame by means of pistons.

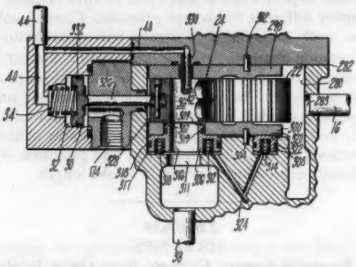
3,650,643

FLUID PUMP AND DELIVERY SYSTEM

Charles W. Grennan, Newington, and Richard J. Hearn, Hartford, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Continuation-in-part of application Ser. No. 767,293, Oct. 14, 1968, now Patent No. 3,547,557. This application Apr. 30, 1970, Ser. No. 33,360
Int. Cl. F01c *19/10*; F03c *3/00*; F04c *27/00*
U.S. Cl. 418—126 7 Claims

A fuel pump and delivery system for gas turbine engines is disclosed having a plurality of interrelated pumping circuits to meet the engine fuel requirements over the entire range of engine operation. The system has three distinct but interrelated circuits for (1) start up and low-speed operating requirements, (2) normal operating requirements above engine idle speed, and (3) high altitude cruise requirements. A positive displacement gear pump functions in the low speed and start up circuit to provide the necessary dry lift and high pressure, and after the start-up requirements have been met this part of the displacement gear pump is unloaded to terminate its pumping action, but the gear train is employed to drive selectively operative centrifugal pumps of different



capacities suitable to meet the engine fuel requirements for either normal operations or for high altitude cruise.

ERRATUM

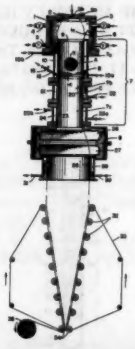
For Class 425—408 see:
Patent No. 3,650,030

3,650,644

APPARATUS FOR BIAXIALLY STRETCHING THERMOPLASTIC TUBULAR FILM

Alfred Ebert; Ernst Pirot, both of Wuppertal-Barmen; Fritz Holler, Wuppertal-Langerfeld, and Georg Steinhilber, Wuppertal-Elberfeld, all of Germany, assignors to J. P. Bemberg Aktiengesellschaft, Wuppertal, Germany

Original application Feb. 2, 1968, Ser. No. 702,733, now Patent No. 3,544,667. Divided and this application Apr. 23, 1970, Ser. No. 43,302
Claims priority, application Germany, Feb. 10, 1967, B 91113; Aug. 9, 1967, B 93882; Jan. 8, 1968, B 96135; B 96137; B 96138
Int. Cl. B29d *7/16*
U.S. Cl. 425—66 18 Claims



Process and apparatus wherein an extruded seamless thermoplastic tubular film is biaxially stretched by a longitudinal drawing accompanied by an inflation or blowing for transverse stretch. After first inflating the initially extruded film tube under a counterpressure of an externally applied cooling gas in a pressure chamber, the tubular film is necked down from the pressure chamber to pass through an elongated pipe

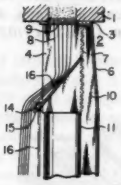
having at least a first cooling section of reduced surface contact with the tubular film, after which the tubular film is reheated for further inflation and/or longitudinal stretching and may then be subsequently tempered to achieve uniform and/or stable dimensions. The resulting inflated and biaxially stretched tube is collapsed or flattened and collected on a take-up roll in the usual manner.

3,650,645

SPINNING CHIMNEY

Seibi Yamada, and Reizo Asada, both of Matsuyama-shi, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 17, 1969, Ser. No. 867,130
Claims priority, application Japan, Oct. 25, 1968, 43/93141
Int. Cl. D01d *7/00*
U.S. Cl. 425—71 **2 Claims**



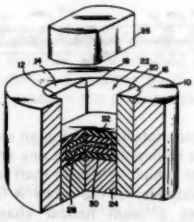
In a spinning chimney comprising side plates and a back plate such a manner that a front part of the chimney is opened, in which extruded filaments are quenched and solidified by a stream of fluid blown in a direction from the back plate to the front part of the chimney through a screen; a plate at one end is swingably spanned with both front ends of said side plates, and said plate at the other end reclined slantly against the screen in order to remove waste filaments therefrom during the start-up of the spinning operation.

3,650,646

APPARATUS FOR FORMING POWDER COMPACTS OF UNIFORM INTERCONNECTED POROSITY

Milton E. Kirkpatrick, Palos Verdes Peninsula, and Ralph A. Mendelson, Westminster, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Original application Feb. 23, 1968, Ser. No. 707,813, now Patent No. 34,946,425, which is a continuation-in-part of application Ser. No. 509,970, Nov. 26, 1965, now abandoned. Divided and this application Aug. 8, 1969, Ser. No. 848,641
Int. Cl. A61c *13/00*
U.S. Cl. 425—78 **12 Claims**



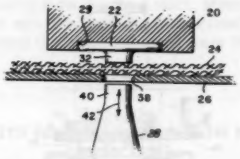
Powder compacting apparatus includes an enclosure made of two parts of elastomeric material. One internal part contains the powder and is made of relatively soft, flowable, elastomeric material. The other part is external to the first part and is made of relatively hard, elastomeric material. The enclosure fits in a die cavity, with the hard elastomeric part placed to form a seal between the soft elastomeric part and the interface or open junction between walls of the die cavity. Pressing force applied to the die is transmitted to all sides of the enclosure to exert pressure isostatically on the powder, with the hard elastomeric part pressed against the wall interface of the die cavity to prevent extrusion of the soft elastomeric part from the die cavity.

3,650,647

APPARATUS FOR SECURING BUTTONS TO FABRIC

Herbert V. Jacobs, Lower Merion, Pa., and Donald Kirk, Jr., St. Petersburg, Fla., assignors to Jacobs Machine Corporation, West Conshohoken, Pa., by said Herbert V. Jacobs

Filed May 21, 1969, Ser. No. 826,587
Int. Cl. B29c *3/00*
U.S. Cl. 425—109 **4 Claims**



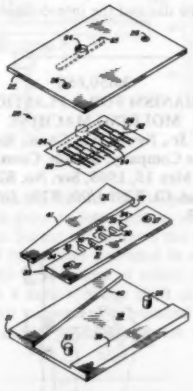
A method and apparatus for securing buttons to fabric. The method comprises providing a button with a thermoplastic portion and securing the button to fabric by applying ultrasonic energy to the thermoplastic portion which enables securement between the button and the fabric by the flowing of the thermoplastic portion into the fabric.

3,650,648

SYSTEM FOR MOLDING ELECTRONIC COMPONENTS

Richard A. Lambrecht, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 25, 1970, Ser. No. 13,956
Int. Cl. B29c *6/04*
U.S. Cl. 425—129 **19 Claims**



System for injection molding components including process and an apparatus consisting of at leas. two mold parts having molding cavities formed therein when the parts are brought together, a sheet-like frame member disposed between the mold parts and having a pattern of cutouts therein defining central openings in registry with mold cavities and pairs of slots in the sheet extending from the openings to form elongated prong-like strips which extend into the cavities and support the electronic components

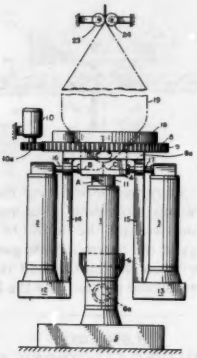
therein, and a passage in one of the mold parts overlying the slots in the sheet whereby fluid molding material can be flowed through said slots and into the cavities to encapsulate the components therein.

3,650,649

APPARATUS FOR PRODUCING A MULTI-LAYER BLOWN TUBULAR THERMOPLASTIC FILM

Heinz Schippers, Remscheid-11, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Aug. 3, 1970, Ser. No. 60,390
Claims priority, application Germany, Aug. 2, 1969, P 19 39 528.9
Int. Cl. B29d *23/04*
U.S. Cl. 425—131 10 Claims



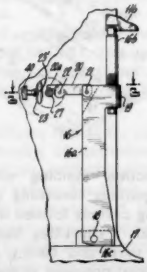
Apparatus for the continuous extrusion of a multi-layer blown tubular thermoplastic film wherein the extrusion die is rotatably mounted about a vertical extrusion axis in feed connection with an extruder in which the screw axis coincides with the vertical extrusion axis and also in feed connection with one or more additional extruders mounted for rotation together with the die, preferably with a common drive means and support for the die and the interconnected additional extruders.

3,650,650

SAFETY MECHANISM FOR A PLASTICS INJECTION-MOLDING MACHINE

Francis W. Cook, Jr., Newington, Conn., assignor to The New Britain Machine Company, Britain, Conn.

Filed May 15, 1969, Ser. No. 825,010
Int. Cl. B29f *1/00*; B29c *3/00*
U.S. Cl. 425—153 6 Claims



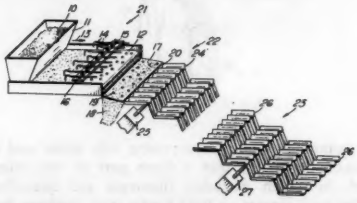
A plastics injection-molding machine carries the parts of a two-part mold, supported respectively on upper and lower platens, one of which is movable toward and away from the other for clamped mating and for separation of the mold halves. Safety dogging mechanism in the form of a drop-bar is mounted to be moved selectively into and out of the path of the one movable platen, when the platens are apart, for preventing the one platen from moving toward the other. A rotatable shaft is connected to position the bar into and out of said path. A handle on the shaft is positioned to overbalance the shaft when the bar is positioned in said path, thereby providing gravity-retention of the safety or blocking position.

3,650,651

APPARATUS FOR PELLETIZING POWDEROUS MATERIALS BY VIBRATIONAL FORCES

Godfrey A. Turner, 277 Glenridge Drive, Waterloo, Ontario, Canada

Filed Sept. 22, 1969, Ser. No. 859,715
Claims priority, application Canada, Apr. 2, 1969, 47,608
Int. Cl. B29b *1/03*
U.S. Cl. 425—197 11 Claims



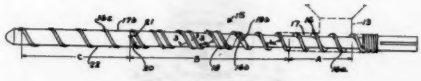
An apparatus for pelletizing powderous materials, such as iron ore and alumina, the apparatus including rows of vibrating trough-like members, each row being spaced below the preceding row so that primary pellets fed into the apparatus pass from the top row to the bottom row of trough-like members and are formed into hard pellets.

3,650,652

APPARATUS FOR EXTRUDING PLASTIC MATERIAL

Robert F. Dray, New Castle, Pa., and Donald L. Lawrence, Toledo, Ohio, assignors to Feed Screws, Inc., New Castle, Pa., by said Robert F. Dray and Owens-Illinois, Inc., Toledo, Ohio, by said Donald L. Lawrence

Filed May 5, 1970, Ser. No. 34,726
Int. Cl. B29f *3/02*
U.S. Cl. 425—206 19 Claims

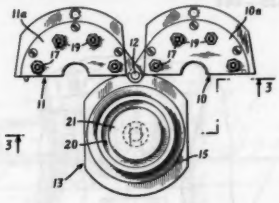


Extruding plastic material utilizing an extruder comprising a cylindrical bore having an inlet at one end and an outlet at the other end in which a single shaft screw is rotatably mounted. The periphery of the screw is formed with a first land that defines a main helical channel that extends throughout the length of the screw. At a point downstream from the inlet, the lead of the first land is increased and a second land begins defining with the first land an auxiliary helical channel. The periphery of the second land is spaced from the surface of the bore a greater distance than the periphery of the first land and the second land terminates at a point spaced rearwardly from the end of the first land and in spaced relation thereto.

3,650,653
MOLD ASSEMBLY FOR MOLDING CHIMED CONTAINERS

Gerald Erickson, P.O. Box 6175, Surfside, Fla.

Filed Oct. 13, 1969, Ser. No. 865,656
Int. Cl. B29c *17/07*; B29d *23/03*
U.S. Cl. 425—218 3 Claims

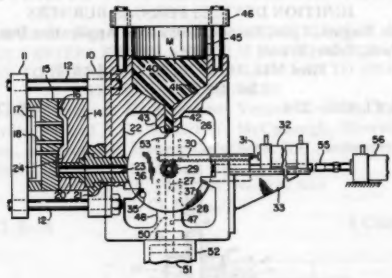


A mold assembly for molding a container having chimes at opposite ends which mold assembly is composed of a plurality of relatively movable mold sections for molding the body of the container, a chime-molding section for molding at least part of one of said chimes and means for moving the chime-molding section from a molding position interlocking with the molded container to a disengaged position to facilitate removal of the chimed container from the mold.

3,650,654
INJECTION MOLDING MACHINE

William H. Schwartz, University Heights, Ohio, assignor to Lester Engineering Company, Cleveland, Ohio

Filed Jan. 24, 1969, Ser. No. 793,838
Int. Cl. B29f *1/02*
U.S. Cl. 425—243 7 Claims



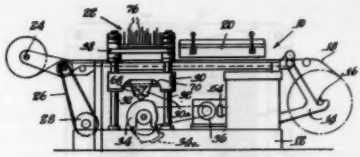
An injection molding machine including a shot cylinder which is indexed between an inject and shot preparation position, the cylinder in the latter position having forced therein under high pressure the plastic material forming the shot.

3,650,655
APPARATUS FOR FORMING AND STACKING CONTAINER LIDS

Ioannis A. Santouris, 141 West Jackson Blvd., Chicago, Ill.

Filed Dec. 10, 1969, Ser. No. 883,940
Int. Cl. B29c *17/00*
U.S. Cl. 425—289 13 Claims

The present invention relates generally to improvements in apparatus for forming relatively shallow container lids and the like and more particularly to apparatus for (i.e., production of such lids from heated plastic sheet material. The present application discloses apparatus for feeding a web of heated plastic sheet material to a forming station. The forming station comprises a mold cavity positioned above the heated sheet material, and a plunger means beneath the sheet material. Relative movement between the mold cavity and

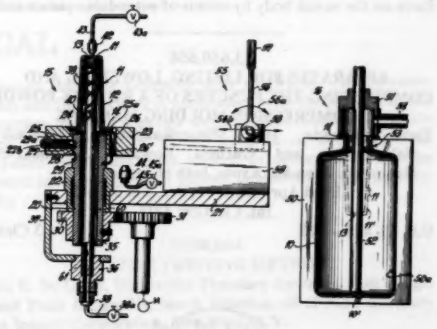


plunger means causes a shallow container lid or the like to be formed and sheared from the sheet stock. Means superimposing the plunger means is provided for successively receiving completely formed lids and positioning them in stacked relation.

3,650,656
APPARATUS FOR MAKING HOLLOW PLASTIC ARTICLES

Gunther Schmid, Stuttgart-Mohringen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 13, 1969, Ser. No. 832,951
Claims priority, application Germany, July 27, 1968, P 17 79 306.5
Int. Cl. B29d *23/03*
U.S. Cl. 425—387 9 Claims



Selected portions of tubular thermoplastic parisons are heated from inside prior to introduction into the cavity of a blow molding unit. Steam which heats the parisons from inside is discharged by orifices provided in a hollow mandrel which is connected to a source of steam and extends with clearance through a hollow rotary shaft cooperating with a clamping device for parisons. The mandrel can be mounted for reciprocatory and/or rotary movement with reference to the shaft.

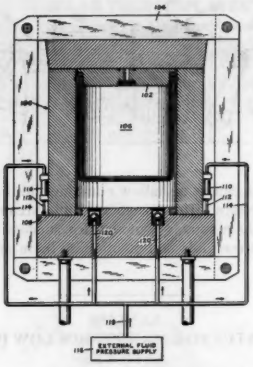
3,650,657
YOKE TYPE ISOSTATIC PRESS

Donald E. Witkin, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Aug. 5, 1970, Ser. No. 61,349
Int. Cl. B29c *3/00*; B30b *5/02*
U.S. Cl. 425—389 5 Claims

An isostatic press comprising an upstanding, hollow cylindrical vessel body which has both upper and lower ends

sealed with plug type closures held in place by a yoke structure. The pressurization within the closed vessel is applied to a hydraulic structure to continuously lift the vessel body into contact with the upper closure when a predetermined pressurization is exceeded. In one embodiment the hydraulic



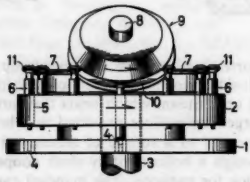
structure includes a lower closure seal having a diameter which exceeds the diameter of the upper closure seal. In another embodiment the hydraulic structure includes hydraulic cylinders, which are connected by fluid passages to the interior of the pressure vessel, and which exert an upward force on the vessel body by means of extendable piston rods.

3,650,658

APPARATUS FOR LIFTING, LOWERING AND COMPRESSING THE PUNCHES OF A ROTARY POWDER COMPRESSION MOLDING MACHINE

Yasuo Shimada, 104, Minamikamiai-cho, Nishinokyo, Nakakyo-ku, and Giichiro Kowada, 3, Inoke-cho, Hanazono, Ukyo-ku, Kyoto, both of Japan

Filed Apr. 28, 1970, Ser. No. 32,643
Int. Cl. B29c *3/02*
U.S. Cl. 425—418 **3 Claims**



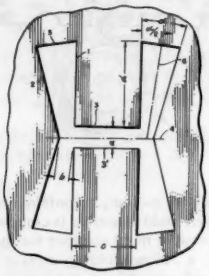
Apparatus for lifting, lowering and compressing one of the punches in a rotary powder compression molding machine at an angle which is inclined wherein a rotating cam having an annular groove and rotating to the horizontal is mounted above a punch holding block of a rotary powder compression molding machine. The head of the punch is fitted in the annular groove of the rotating cam, thereby lifting and lowering the punch at least in the part of the punch holding block before and behind the position of compression, and compressing the punch at the position of compression.

3,650,659

SPINNING DIE

Hans Stapp, Momlingen, Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Mar. 31, 1970, Ser. No. 24,094
Claims priority, application Germany, Apr. 5, 1969, G 69 13 818
Int. Cl. D01d *3/00;* **B28h** *21/54*
U.S. Cl. 425—461 **9 Claims**



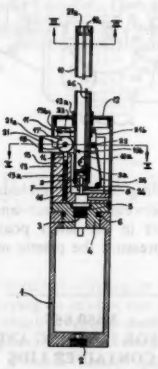
Spinning nozzle and the production of profiled filaments, threads, bristles or the like in the melt-spinning of a synthetic thermoplastic high molecular weight fiber-forming linear polymer by means of an H-shaped spinning orifice or opening wherein the crossbar flanks are parallel to and the inner flanks of the legbars are perpendicular to the axis of symmetry, the outer flanks of the legbars of the H-shaped orifice being at an angle of at least 5° up to 45° to the corresponding inner flanks.

3,650,660

FLAME CONVEYING TUBES OR WAVE TUBES FOR IGNITION DEVICES FOR GAS BURNERS

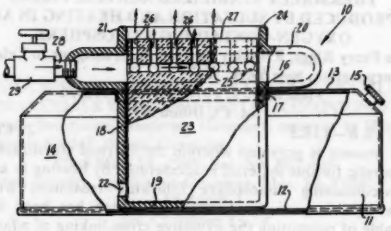
Alain Huguet, Lyon, France, assignor to Application Des Gaz, Paris, Seine, France

Filed Mar. 16, 1970, Ser. No. 19,677
Int. Cl. F23q *2/16*
U.S. Cl. 431—254 **5 Claims**



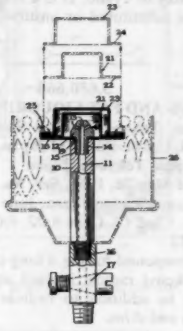
The invention relates to an ignition device for gas burners comprising a flame conveying tube or wave tube conveys a combustible gas to the outlet of the tube and a capillary bore auxiliary tube passing up the wave tube to convey gas to the end of the wave tube for ignition to maintain the ignition of the flame from the wave tube.

3,650,661
LIQUID FUEL BURNER
Enrique L. Laguinia, No. 6 Bulletin St., West Triangle, Diliman, Quezon City, Philippines
Filed Nov. 13, 1969, Ser. No. 876,245
Int. Cl. F23d 13/16
U.S. Cl. 431—328 1 Claim



A burner for liquid fuel in which a porous ceramic block is wetted with fuel and the fuel travels to an upper surface thereof by capillary action. Air is pumped through openings in the porous ceramic block to also reach the upper surface with the fuel burning from the upper ceramic surface. In a modified form the fuel burns from a side face of the ceramic block.

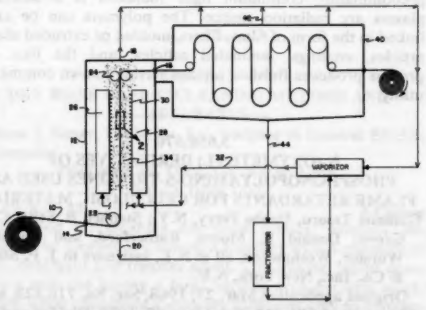
3,650,662
OPEN FLAME BURNER
Francis W. Werring, Baltimore, Md., assignor to The Welsbach Corporation, Philadelphia, Pa.
Filed Nov. 5, 1970, Ser. No. 87,113
Int. Cl. F23d 13/14
U.S. Cl. 431—329 5 Claims



An open flame gas burner has a body portion bringing the gas to a perforated tip. The top screws onto the body and clamps a bottom screen between it and the body extending in a plane at right angles thereto. The bottom screen is circular and two interfitted spaced inner and outer cup-shaped screen members over the tip are supported by the lower screen whose periphery is turned over to engage extending peripheral edges of the cup-shaped screens.

CHEMICAL

3,650,663
METHOD FOR TREATING SYNTHETIC LINEAR POLYESTERS FIBERS AND FILM IN THE VAPOR PHASE TO IMPROVE THE DYEABILITY AND TO HEAT SET SAID POLYESTERS
Frederick E. Barwick, III, Charlotte; Vernon C. Smith, Huntersville, both of N.C.; Robert W. McCullough, Riverside, Conn., and James B. Hobgood, Roxboro, N.C., assignors to Collins & Aikman Corporation, New York, N.Y.
Filed Sept. 15, 1969, Ser. No. 857,844
Int. Cl. D06p 3/00
U.S. Cl. 8—4 9 Claims



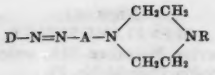
A method is provided for improving the dyeability and for heat setting synthetic linear polyesters, wherein the polyester in fibrous or film form is contacted with a vapor of a monocyclic or bicyclic halogenated aromatic hydrocarbon for 10^{-4} to 20 seconds. The halogenated aromatic hydrocarbon is removed from the polyester after treatment. The polyester fibers and films treated in accordance with the method of this invention exhibits superior dyeing properties being readily dyed to deep shades in the absence of a carrier. The polyester fibers and films treated in accordance with the present invention likewise exhibit improved dimensional stability.

3,650,664
TEXTILE PRINTING METHOD
John E. De Graff, Waldwick; Theodore Antoniou, Oak Ridge, and Peter Baganakis, North Haledon, all of N.J., assignors to Inmont Corporation, New York, N.Y.
Filed Apr. 4, 1968, Ser. No. 718,946
Int. Cl. D06p 5/04; C09b 27/00; D06 ; C08f 45/26
U.S. Cl. 8—18 1 Claim

Textile print pastes containing an aqueous phase emulsified into a continuous phase containing pigment dispersed in a solution of resins, including a vinyl acetate-ethylene copolymer containing 20.0 to 50.0 percent vinyl acetate.

3,650,665
DYEING AND PRINTING ACRYLIC MATERIAL USING DISPERSE DYESTUFFS
Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland
Filed Sept. 23, 1969, Ser. No. 860,405
Claims priority, application Switzerland, Oct. 4, 1968, 14836/68
Int. Cl. C09b 29/36; D06p 1/18
U.S. Cl. 8—41 7 Claims

A process for dyeing or printing acrylic textile material, wherein a dyestuff of the formula



is used which is free from groups conferring solubility in water, and in which R is a hydrogen atom or a lower alkyl residue containing one to four carbon atoms that may be substituted by hydroxy or cyano, D is a residue of a diazo component and A is substituted or unsubstituted 1,4-phenylene residue.

3,650,666

TANNING AND FAT LIQUORING METHOD

Teisuke Shimizu, Tokyo-to; Atsuo Sasaki, Omiya-shi, and Shigeo Nagaki, Urawa-shi, all of Japan, assignors to Cashew Kabushiki Kaisha, Tokyo-to, Japan

Filed May 20, 1968, Ser. No. 730,660

Claims priority, application Japan, June 13, 1967, 42/37285

Int. Cl. C14c *9/02, 9/04*

U.S. Cl. 8—94.22 **9 Claims**

A phenolic compound having a long-chain alkyl radical or a long-chain alkenyl radical is used as a tanning and fat-liquoring agent in addition to ordinary tanning agents in tanning of hides and skins.

This invention relates generally to the art of processing animal hides and skins and more particularly to a new and improved method and fat liquoring agents for tanning hides and skins.

3,650,667

LAUNDRY PROCESS FOR PRODUCING FABRICS THAT ARE SUBSTANTIALLY FREE FROM BACTERIA AND BACTERIAL SPORES

Louis F. Luechauer, Salt Lake City, Utah, assignor to Steiner American Corporation, Salt Lake City, Utah

Continuation-in-part of application Ser. No. 802,670, Feb. 26, 1969, now abandoned. This application Dec. 12, 1969, Ser. No. 884,694

Int. Cl. D06l *3/02*

U.S. Cl. 8—111 **28 Claims**

Method (A) for laundering fabrics comprising washing said fabrics in hot water at a medium water level in the presence of soap and a sequestering agent; flushing the fabric load; washing the fabric at a low water level for about 10 to about 15 minutes at a temperature of about 175° to about 195° F. in the presence of a strong alkali and soap or a detergent; flushing the fabric load; bleaching the fabric load in hot water at a medium water level with an oxygen-containing bleach which is hydrogen peroxide or a material that forms hydrogen peroxide or nascent oxygen in the presence of water at a concentration of about 0.1 to about 0.2 percent by weight of the dry fabric weight, the bleaching being carried out at a temperature of at least about 175° F. for about 6 to about 10 minutes; rinsing the fabric load; souring the fabric load in the presence of a souring agent and a water soluble germicide at a concentration level sufficient to inhibit the growth of mildew in the laundered fabric, and extracting the water from the soured fabric load.

Method (B) for laundering fabrics comprising washing said fabrics in hot water at a medium water level in the presence of soap and a sequestering agent; flushing the fabric load; treating the fabric load at a low water level at a water temperature of about 140° to about 160° F. in the presence of an oxygen-containing bleach which is hydrogen peroxide or a material which forms hydrogen peroxide or nascent oxygen in the presence of water for a time sufficient to obtain substantially uniform penetration of the oxygen-containing bleach into the fabric with the concentration of oxygen-containing bleach ranging from about 0.1 to about 0.2 percent by weight of the dry fabric; increasing the temperature of the fabric load to at least about 175° F. in the presence of a strong alkali and soap or a detergent for about 10 to about 15 minutes; rinsing the fabric load; souring the fabric load in the presence of a water-soluble germicide at a concentration level sufficient to inhibit the growth of mildew in the laundered fabric, and extracting the water from the soured fabric load.

The use in either of the above described methods (A) and (B) of a hypochlorite bleach step subsequent to the treatment with the oxygen-containing bleach and prior to the souring treatment to remove stains from the fabric.

3,650,668

THERMALLY STABILIZED ACRYLIC FIBERS PRODUCED BY SULFATION AND HEATING IN AN OXYGEN-CONTAINING ATMOSPHERE

John Perry Riggs, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,876

Int. Cl. D06m *3/22*

U.S. Cl. 8—115.5 **21 Claims**

A process is provided wherein the thermal stabilization of an acrylic fibrous material is accelerated by heating in an oxygen-containing atmosphere following treatment with a water-soluble persulfate compound which has been found capable of promoting the oxidative cross-linking of adjoining polymer molecules. The treatment with the water-soluble persulfate compound results in the sulfation of the acrylic polymer and renders the same amenable to oxidative cross-linking on a more expeditious basis. The resulting stabilized fibrous materials are non-burning when subjected to an ordinary match flame, and may be utilized as fire resistant textile fibers, or optionally converted to a carbonized fibrous material by heating in an inert atmosphere at a more highly elevated temperature.

3,650,669

TREATMENT OF MONOMERIC AND POLYMERIC SYSTEMS WITH HIGH INTENSITY PREDOMINANTLY CONTINUUM LIGHT RADIATION

Claiborn Lee Osborn, and David John Trecker, both of So. Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 794,752, Jan. 28, 1969, now abandoned , and a continuation-in-part of 838,460, July 2, 1969, now abandoned. This application Sept. 2, 1970, Ser. No. 69,041

Int. Cl. B01j *1/00;* **C08d** *1/00;* **C08f** *1/00*

U.S. Cl. 8—115.5 **33 Claims**

High intensity predominantly continuum light radiation having an intensity of at least about 350 watts per square centimeter steradian is used to polymerize monomers and to crosslink polymers. A convenient source of this high intensity predominantly continuum light radiation is a swirl-flow plasma arc radiation source. The polymers can be cross-linked in the form of films, fibers, molded or extruded shaped articles, coatings, laminated articles, and the like. The process produces finished articles having known commercial utility.

3,650,670

N-(OXYMETHYL) DERIVATIVES OF PHOSPHONOPOLYAMINO-S-TRIAZINES USED AS FLAME RETARDANTS FOR CELLULOSIC MATERIALS

Guiliana Tesoro, Dobbs Ferry, N.Y.; Stephen B. Sello, Cedar Grove; Donald R. Moore, Rutherford, and Rudolf F. Wurster, Weehawken, all of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Original application Mar. 27, 1968, Ser. No. 716,323, now Patent No. 3,551,422, dated Dec. 29, 1970. Divided and this application Apr. 15, 1970, Ser. No. 33,147

Int. Cl. D06m *13/28, 13/32, 13/44*

U.S. Cl. 8—116.3 **6 Claims**

There are disclosed N-(oxymethyl) derivatives of

phosphonopolyamino-s-triazines, such as 2,4-bis-(hydroxymethyl)-6-(0,0'-diethylphosphonomethyl)-s-triazine and the corresponding 2,4-bis(methoxymethyl) derivative. These compounds are produced by reaction of the corresponding amine, e.g., 2,4-diamino-6-(0,0'-diethylphosphonomethyl)-s-triazine, with formaldehyde, either alone or in combination with an alkanol, such as methanol, in aqueous medium. The products are useful either alone or in combination with organo-nitrogen compounds as flame-retardant agents for cellulose. A durable treatment is obtained by insolubilization with acidic catalysts or hydrogen peroxide.

3,650,671

PROCESS FOR FINISHING CELLULOSIC TEXTILE MATERIALS WITH N-METHYLOL COMPOUNDS

Gerhard Bergmann, Niederau, Germany, assignor to Hoesch-Chemie GmbH, Duren, Germany

Filed Mar. 14, 1969, Ser. No. 807,402
Claims priority, application Germany, Mar. 16, 1968, P 17 19 546.9
Int. Cl. D06m *13/34*
U.S. Cl. 8—116.3 **17 Claims**

Finishing treatment of textile materials such as cotton is effected by impregnating such material with a cross-linking, resin-forming, nitrogen-containing methylol compound such as dimethylol urea, dimethylol dihydroxy-ethylene urea, methylol acrylamide in the presence of an acid catalyst, like trichloro acetic acid either alone or preferably in mixture with its salts or a mixture of a thermally unstable acid with a salt of trichloro acetic acid.

3,650,672

FABRIC TREATMENT PROCESSES

Francis H. Swayn, 5 Elton Avenue, Blundellsands, Liverpool 23, England

Filed Nov. 27, 1968, Ser. No. 779,573
Claims priority, application Great Britain, Oct. 3, 1968, 46,886/68; Dec. 1, 1967, 54,843/67
Int. Cl. B08b *3/00*
U.S. Cl. 8—137 **2 Claims**

Fabric is treated with a detergent solution and then dried to form a pliable protective coating of detergent on the fabric. The treated fabric is subsequently washed after use simply by rinsing in water, when the detergent coating, which may incorporate chemical agitators, is activated to wash the fabric. A fresh detergent coating can then be applied to the clean fabric.

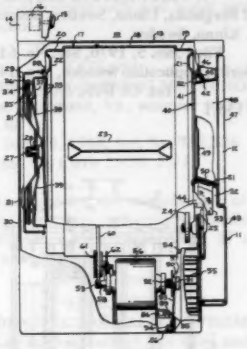
3,650,673

DRY WASH FABRIC CLEANING METHOD AND APPARATUS

William J. Ehner, Louisville, Ky., assignor to General Electric Company

Filed Nov. 24, 1969, Ser. No. 879,315
Int. Cl. D06l *1/02*
U.S. Cl. 8—137 **6 Claims**

A method for cleaning soil from fabrics, whereby the fabrics to be cleaned are tumbled together with a quantity of water, detergent and transfer agent. The transfer agent comprises a material having a large surface area per unit mass, and the water comprises a quantity sufficient only to dampen the fabrics. The tumbling causes the water, the detergent and the transfer agent to contact the fabrics, and causes soil from the fabrics to be distributed over the combined exposed surface areas of the fabrics and the transfer agent. Subsequently, the soiled transfer agent is separated from the fabrics, whereby the fabrics are cleaned of the soil distributed onto the transfer agent. An improved domestic automatic clothes



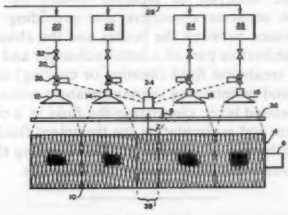
dryer is provided for performing therein the aforementioned method.

3,650,674

METHOD AND APPARATUS FOR DYEING A CONTINUOUS LENGTH OF YARN

Richard C. Newton, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Aug. 17, 1970, Ser. No. 64,441
Int. Cl. B05c *5/00*
U.S. Cl. 8—149 **8 Claims**



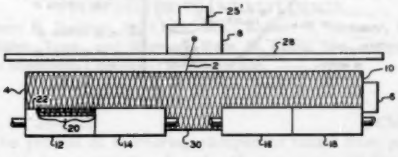
A takeup roll is rotated to wind a continuous length of yarn thereupon. During winding of the yarn, dye spray nozzles positioned adjacent to the yarn on the takeup roll discharges dye onto the yarn for dyeing said yarn.

3,650,675

METHOD AND APPARATUS FOR DYEING A CONTINUOUS LENGTH OF YARN

Richard D. Meyer, and Richard C. Newton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Aug. 17, 1970, Ser. No. 64,399
Int. Cl. B05c *1/10*
U.S. Cl. 8—149 **7 Claims**



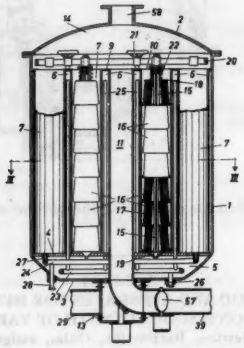
A takeup roll is rotated to wind a continuous length of yarn thereupon. During winding of the yarn, a dye roller positioned adjacent the yarn on the takeup roll contacts the yarn and discharges dye onto the yarn for dyeing said yarn.

3,650,676

METHOD FOR TREATING TEXTILE MATERIAL WITH A CIRCULATING LIQUID

Niels Rudolf Bergholtz, Uinna, Sweden, assignor to AB Ludvig Svensson, Kinna, Sweden

Filed Jan. 5, 1970, Ser. No. 612
Claims priority, application Sweden, Jan. 14, 1969, 392/69
Int. Cl. B05c *8/02*
U.S. Cl. 8—155.1 5 Claims



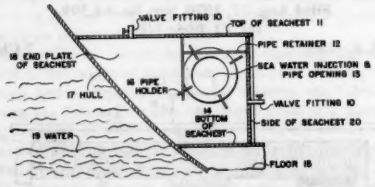
The steps of placing material to be treated in a container, forming the material as separate bodies by placing the material in separate chambers and providing a relatively small clearance between the bodies and the chambers; forming the chambers as part of a heat-exchanger and providing a circulating treatment fluid (heating or cooling) in controlled quantities and maintaining the temperature within the chambers at a desired level; circulating the fluid in a closed circulation system and recirculating the treatment fluid repeatedly through the bodies of material and/or reversing the direction of flow of treatment fluid through the chamber.

3,650,677

SEA CHEST PROTECTION PROCESS

David J. Mauter, Edgewater, N.J., and Jack A. Antinori, Bayside, Long Island, N.Y., assignors to Drew Chemical Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 861,045
Int. Cl. C23f *11/10*
U.S. Cl. 21—2.5 5 Claims



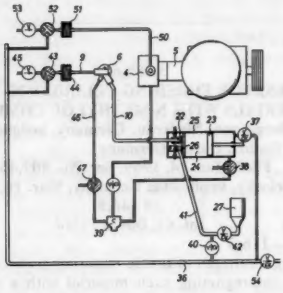
Method of protecting sea chests of vessels during layup by filling the chest with a substantially biodegradable vegetable oil based composition which has a melting point of between 25° and 50° C.

3,650,678

APPARATUS FOR THE STERILIZATION OF A MACHINE

Gerhard Hansen, Hofener Strasse 47, D 7013 Oeffingen (Wuertt), Germany

Filed Dec. 9, 1968, Ser. No. 782,294
Claims priority, application Germany, Dec. 20, 1967, P 16 42 069.2
Int. Cl. A61l *3/00*
U.S. Cl. 21—91 7 Claims



Apparatus for the sterilization of a machine for the production, filling and closing of containers wherein a source delivering a sterilizing agent is connected to various elements of the machine.

3,650,679

REFINING LOW-GRADE BERYLLIUM ORES BY TREATMENT WITH ANHYDROUS SULFUR TRIOXIDE

Fathi Habashi; Raymond Dugdale, and Francis L. Holdereed, all of New York, N.Y., assignors to The Anaconda Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,422
Int. Cl. C22b *59/00;* C01f *3/00*
U.S. Cl. 23—15 R 8 Claims

Low-grade substantially dry beryllium-containing ores are reacted directly with anhydrous sulfur trioxide, at temperatures ranging from 50° to 350° C., to form beryllium sulfate. The reaction product is then leached with water to dissolve the beryllium sulfate. The resulting solution is separated from the insoluble residue and the beryllium is subsequently recovered from the leach solution.

3,650,680

PROCESSES FOR OBTAINING VANADIUM SUBOXIDES

Robert O. Teeg, Grosse Pointe Farms, and Robert W. Hallman, St. Clair Shores, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Original application Apr. 7, 1964, Ser. No. 358,065, now Patent No. 3,455,724. Divided and this application Apr. 12, 1965, Ser. No. 447,546. The portion of the term of this patent subsequent to July 15, 1986, has been disclaimed.
Int. Cl. C22b *59/00;* C01g *31/00*
U.S. Cl. 23—21 4 Claims

Methods for obtaining vanadium suboxide of the general formula VO_x, wherein x is comprised between 1.5 and 2.02, consisting in heating vanadium pentoxide, contained in an inert boat, in a reduced atmosphere in the presence of a stoichiometric amount of vanadium pentoxide or, alternately, in continuously evacuating the atmosphere of the vessel in which the boat is placed, and recovering the vanadium suboxide in a bulk or crystalline form remaining in the boat.

3,650,681

METHOD OF TREATING A TITANIUM OR ZIRCONIUM SALT OF A PHOSPHORUS OXYACID

Yujiro Sugahara, Tokyo; Hiroyuki Naito; Kiyoshi Takai, and Kouichi Usui, all of Tsuruoka-shi, Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1969, Ser. No. 847,633
Claims priority, application Japan, Aug. 8, 1968, 43/55974; Nov. 27, 1968, 43/86350
Int. Cl. C22b *59/00*
U.S. Cl. 23—21 4 Claims

A method of treating a titanium or zirconium salt of a phosphorus oxyacid, which comprises heating a mixture of carbon and a titanium or zirconium salt of a phosphorus oxyacid at a temperature exceeding 900° C. in a non-oxidizing atmosphere or heating a titanium or zirconium salt of a phosphorus oxyacid at a temperature exceeding 900° C. in absence of carbon in a carbon monoxide atmosphere, thereby separating the phosphorus oxyacid component as phosphorus vapor and recovering the titanium or zirconium component as solid residue.

3,650,682

PROCESS FOR THE PRODUCTION OF ALKALI METAL PERBORATES

Heinrich Till, Tyrol, Austria, assignor to Sandoz Limited, Basel, Switzerland

Continuation-in-part of application Ser. No. 594,988, Nov. 17, 1966, now abandoned, Continuation-in-part of application Ser. No 753,763, Aug. 19, 1968, now abandoned, Continuation-in-part of application Ser. No. 837,983, May 15, 1969, now abandoned, Continuation in-part of application Ser. No. 551,537, May 20, 1966, now abandoned. This application July 15, 1969, Ser. No. 841,978. Claims priority, application Austria, May 20 1965, A 4586/65; July 14, 1966, A 10310/66; Nov. 7, 1966, A 10268/66; July 16, 1968, A 6848/68; Switzerland, July 23, 1968, 11050/68
Int. Cl. C01b *15/12*
U.S. Cl. 23—60 33 Claims

This invention is directed to a process for preparing alkali metal perborates and may take the form of various embodiments in which hydrogen peroxide is formed in organic solution and reacted with borate. In one embodiment a single reaction step is used wherein an organic compound containing at least two hydrogen atoms capable of being oxidized to hydrogen peroxide is reacted with oxygen in an organic solvent and in the presence of solid alkali metal borate and water wherein the organic solvent is a solvent for the water and the organic compound but not for the alkali metal borate and perborate. In another embodiment the hydrogen peroxide is formed in an organic solvent as described above and subsequently reacted with alkali metal borate in the presence of water in an amount of from more than 1 mole to 5 moles at a temperature of 10°–60° C. In another embodiment the one or two step processes are conducted using less than one mole of alkali metal borate per gram atom active oxygen present or theoretically obtainable from the said organic compound. The process may be conducted wherein the water content is regulated according to the inequalities defined in the claims and utilizing sodium metaborate or disodium tetraborate or mixtures thereof.

3,650,683

PROCESS FOR THE MANUFACTURE OF CONDENSED ALUMINUM PHOSPHATES

Albert Hloch, Frankfurt/Main; Nikolaj Medic, Kelkheim/Taunus, and Rudolf Kohlhaas, Frankfurt/Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed May 9, 1969, Ser. No. 823,496
Claims priority, application Germany, May 13, 1968, P 17 67 460.1
Int. Cl. C01b *25/36*, *25/38*
U.S. Cl. 23—105 4 Claims

The preparation of condensed aluminum phosphates containing phosphorus pentoxide and aluminum trioxide in a molar ratio within the range of from 1.1 : 1 to 3 : 1 is carried out by reacting water-soluble alkali metal polyphosphates with water-soluble aluminum salts and water and subjecting them to a heat treatment.

3,650,684

MANUFACTURE OF POTASSIUM METAPHOSPHATE

James W. Watson, Richmond, Va., assignor to Swift & Company, Chicago, Ill.

Filed Dec. 10, 1968, Ser. No. 782,726
Int. Cl. C01b *25/30*, *25/38*
U.S. Cl. 23—107 4 Claims

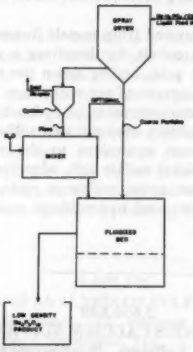
A process is disclosed for the manufacture of potassium metaphosphate by reacting potassium chloride with superphosphoric acid on a free flowing bed of inert solids under essentially anhydrous conditions.

3,650,685

LOW BULK DENSITY SODIUM POLYPHOSPHATES

James N. Dyer; Leo B. Post, both of New City, and Herbert J. Rosen, Yonkers, all of N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,393
Int. Cl. C01b *25/30*, *25/38*
U.S. Cl. 23—107 4 Claims



Sodium polyphosphates and particularly sodium tripolyphosphates which generally find use as detergent builders are prepared in low bulk density, high relatively non-frangible granular yields by spray drying an aqueous solution of monosodium/disodium orthophosphate salts having an $NaO:P_2O_5$ ratio of from 1 to 2, hydrating the spray dried product or the fines to a LOI of between about 18% and about 25% and intermolecularly dehydrating the hydrated product in a fluidized converter at a temperature of between about 200° C. and 500° C. to provide the desired product.

3,650,686

PROCESS FOR RECOVERY OF PHOSPHOROUS VALUES FROM DILUTE PLANT EFFLUENTS

Robert B. Hudson, St. Louis, Mo.; Robert E. Mesmer, Oak Ridge, Tenn., and Roger A. Rose, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 18, 1969, Ser. No. 851,047
Int. Cl. C01b *25/32*; C02c *5/02*
U.S. Cl. 23—109 7 Claims

The process of recovering phosphorus values from plant effluents by precipitating the phosphorus values with lime to obtain a sludge which is difficult to handle is improved by treating the sludge with phosphoric acid so as to convert phosphorus values in the sludge from basic calcium phosphate to crystalline calcium phosphates which are readily filterable and useful as an animal feed supplement.

3,650,687

PROCESS FOR PREPARING BINDERLESS MOLECULAR SIEVE AGGREGATES

Carl Vance McDaniel, Laurel; Philip Kenerick Maher, Baltimore, and Joseph Michael Pilato, Silver Spring, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Original application Sept. 19, 1968, Ser. No. 760,970, now Patent No. 3,472,940, Continuation-in-part of application Ser. No. 515,227, Dec. 20, 1965, now abandoned. Divided and this application May 14, 1969, Ser. No. 841,660

Int. Cl. C01b *33/28*

U.S. Cl. 23—112 7 Claims

Methods of preparing attrition resisting binderless molecular sieve zeolite aggregates having a particle size of about 50 to 200 microns are disclosed. The processes are characterized by a high temperature spray drying step. The product is particularly useful in fluidized adsorption and fluidized catalyst systems.

3,650,688

INDUSTRIAL PROCESS FOR SEPARATION OF NICKEL

Laszlo Fekete; Imre Pataricza; Dezso Bodi; Jozsef Gyuricza; Mihaly Miskei, and Ferenc Orszag, all of Budapest, Hungary, assignors to Metalimpex Acel Es Femkulkereskedelmi Vallalat and Femipari Kutato Intezet, Budapest, Hungary

Filed Oct. 17, 1969, Ser. No. 867,400

Claims priority, application Hungary, Oct. 23, 1968, ME-990

Int. Cl. C01g *53/10, 53/08;* C01b *7/08*

U.S. Cl. 23—117 3 Claims

Nickel can be separated from metals forming chlorocomplex anions, such as cobalt, by dissolving a nickel concentrate in hydrochloric acid, boiling down the nickel chloride solution to a nickel content of not more than 240 grams per liter, increasing the concentration of hydrochloric acid to 7 to 9 moles/liter by adding concentrated sulfuric acid to the solution in an amount equivalent to the nickel present, thereby forming a nickel sulfate salt, adsorbing the metallic contaminations on an anion exchange resin, and isolating hydrated nickel sulfate and hydrochloric acid from the effluent from the resin.

3,650,689

ANHYDROUS CALCIUM SULPHATE

Gerald Waterworth Cafferata, Woodborough, England, assignor to BPB Industries Limited, London, England

Filed May 26, 1969, Ser. No. 827,986

Claims priority, application Great Britain, May 28, 1968, 25,496/68

Int. Cl. C01f *11/46*

U.S. Cl. 23—122 3 Claims

Production of anhydrous calcium sulphate by autoclaving gypsum in saturated steam at a temperature of at least 205° C.

3,650,690

BORIC ACID PRODUCTION

Jerome C. Shiloff, Pleasantville, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 18, 1968, Ser. No. 768,887

Int. Cl. C01b *35/00;* C01d *5/02*

U.S. Cl. 23—149 10 Claims

Boric acid is produced by treating an alkali metal borate ore with concentrated sulfuric acid in an amount sufficient to provide an alkali metal to sulfur mole ratio of 1.5 to 2.5, contacting the so treated ore with superheated steam at temperatures of 100° to 500° C. to produce a gaseous boric acid-containing effluent, removing the effluent and recovering the boric acid therefrom.

3,650,691

METHOD OF PURIFYING A PHOSPHORIC ACID HYDROLYZING SOLUTION

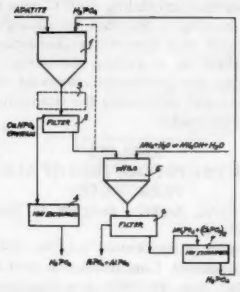
Wilhelm Reulecke, Bensberg; Toni Litzenburger, Bergisch-Gladbach, and Otto Winter, Bergisch-Gladbach-Sand, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Mulheim, Germany

Filed Oct. 5, 1970, Ser. No. 77,923

Claims priority, application Germany, Feb. 10, 1967, K 61389

Int. Cl. C01b *25/18*

U.S. Cl. 23—165 5 Claims



A phosphoric acid solution for hydrolysis of rock phosphate is purified by neutralizing it with a base pH 3.3 to 5.5, thereby causing impurities such as iron and aluminum phosphates to precipitate. After removal of impurities, the solution is brought together with a cationic ion-exchange resin, in hydrogen form, to regenerate highly pure phosphoric acid.

3,650,692

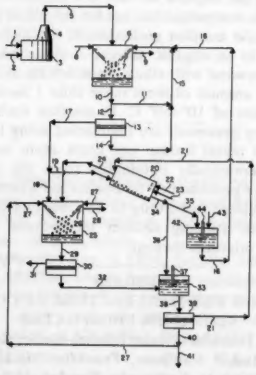
REMOVAL OF SULFUR DIOXIDE FROM WASTE GASES

John F. Villiers-Fisher, Kendall Park, N.J., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,485

Int. Cl. C01b *17/60, 17/56*

U.S. Cl. 23—178 14 Claims



Waste gases containing sulfur dioxide and entrained solids such as fly ash are scrubbed with an aqueous magnesium oxide-sulfite slurry, which dissolves sulfur dioxide to form further magnesium sulfite and also scrubs entrained solids from the gas stream into the aqueous slurry. Magnesium oxide is regenerated by calcining a portion of the slurry or

the solids component of a slurry portion, which generates a dust-laden off-gas rich in sulfur dioxide. Buildup of entrained solids such as fly ash in the system is effectively prevented by scrubbing the dust-laden off-gas with an aqueous solution, to which a portion of the solids component of the slurry or regenerated magnesium oxide may be added. The scrubbing step solubilizes magnesium compounds as magnesium bisulfite, due to high sulfur dioxide concentration, and the resulting aqueous magnesium bisulfite solution is filtered to remove residual solids such as fly ash. Magnesium oxide is added to the residual liquid phase to precipitate solid magnesium sulfite, which is filtered from the final residual liquid phase. A portion of this final liquid phase may be discarded to prevent buildup of alkali sulfates or the like, and the balance of the final liquid phase is recycled to the off-gas scrubbing step. The precipitated solid magnesium sulfite is recycled to the calcining step.

3,650,693
PREPARATION OF FIBROUS TITANIUM DIOXIDE

Hans J. Borchardt, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

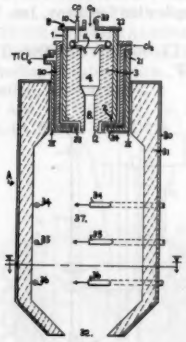
Filed Sept. 24, 1970, Ser. No. 75,234
Int. Cl. C01g *23/04*
U.S. Cl. 23—202 R **2 Claims**

A process is described for producing rutile fibers of unusual dimensional uniformity. Titanium trichloride is reacted at 960°–990° C. with humidified oxygen followed by dry oxygen in the presence of molten sodium and potassium chloride mixtures containing preformed titanium dioxide of pigmentary size.

3,650,694
PROCESS FOR PREPARING PIGMENTARY METAL OXIDE

Edward M. Allen, Doylestown, Ohio, assignor to P.P.G. Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 361,008, Apr. 20, 1964, now abandoned , Continuation-in-part of application Ser. No. 234,962, Nov. 2, 1962, now abandoned , which is a continuation-in-part of application Ser. No. 13,860, Mar. 9, 1960, now Patent No. 3,069,282. This application June 25, 1969, Ser. No. 842,430
Int. Cl. C01g *23/04, 1/02*; C01b *33/18*
U.S. Cl. 23—202 V **12 Claims**

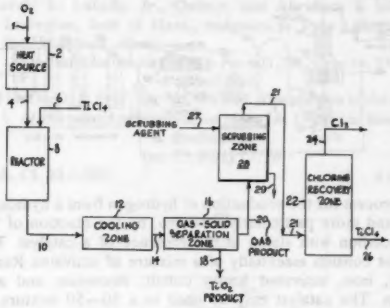


The preparation of pigmentary metal oxide, e.g., titanium dioxide, by vapor phase oxidation of metal halide, e.g., titanium tetrahalide, is described. The difficulties associated with providing a high temperature reaction zone and/or preheating reactants are discussed and a method is proposed for providing heat to the reaction zone to maintain said reaction.

3,650,695
METHOD FOR TREATING TITANIUM DIOXIDE REACTOR DISCHARGE CONTAINING PRODUCTS OF NITROGEN FIXATION

John R. Bogdan, and Alonzo Farmer, both of New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 28, 1969, Ser. No. 853,653
Int. Cl. C01g *23/04*; C01b *21/20*
U.S. Cl. 23—202 V **6 Claims**

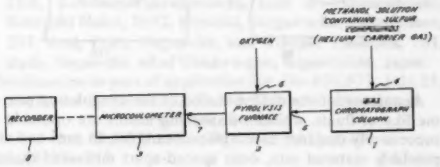


Pigmentary titanium dioxide is produced by vapor phase oxidation of titanium tetrachloride with oxygen at elevated temperatures in a reactor. Gaseous and solid products produced by the reaction are separated and chlorine recovered from the gaseous portion in a chlorine recovery zone. Obstruction of the chlorine recovery zone by products resulting from nitrogen fixation is prevented by scrubbing reactor discharge gas with liquid chlorine, liquid titanium tetrachloride or liquid chlorinated solvents. Removal of the obstruction is accomplished by heating the chlorine recovery zone.

3,650,696
SAMPLING AND ANALYSIS OF SULFUR COMPOUNDS

Ewin A. Eads, Beaumont, Tex., assignor to Lamar State College of Technology, Beaumont, Tex.

Filed Sept. 8, 1970, Ser. No. 70,478
Int. Cl. G01n *31/08, 31/16*
U.S. Cl. 23—230 PC **10 Claims**



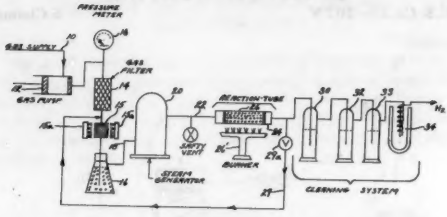
A method for accurately sampling ambient air containing sulfur compounds in the low parts per billion range and for separating, identifying and quantitatively monitoring each sulfur compound. The gaseous sample is collected in substantially sulfur-free methanol. The methanol solution is then passed through a gas chromatograph column packed with octylphenoxypolyethylene on oxyethanol polytetrafluoroethylene to separate the sulfur compounds. From the gas chromatograph the separated sulfur compounds go through a pyrolysis furnace where they are oxidized to sulfur dioxide, and thence into a microcoulometer for titration. By using the same procedure, sulfur compound impurities in solid materials can be identified and quantitatively measured.

3,650,697

METHOD OF HYDROGEN PRODUCTION

Franz Goebel, Columbus, Ohio, assignor to Rand Development Corporation, Cleveland, Ohio

Filed Nov. 25, 1969, Ser. No. 879,791
Int. Cl. C01b *1/18*; B01j *11/22*
U.S. Cl. 23—212 R 9 Claims



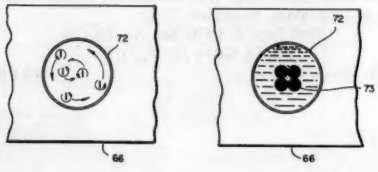
A process for the production of hydrogen from a hydrocarbon, and more particularly methane, by the reaction of the hydrocarbon with steam in the presence of a catalyst. The catalyst consists essentially of a mixture of activated Raney nickel, iron, activated Raney cobalt, zirconium and aluminum. The catalyst may be used in a 50—50 mixture of quartz sand or alumina and catalyst. The process is carried out at a relatively low temperature of between approximately 300° to 550° C.

3,650,698

APPARATUS FOR THE AUTOMATIC DETERMINATION OF THE COAGULATION, AGGREGATION AND OR FLOCCULATION, OR THE LIKE, RATES OF FLUIDS, AND NOVEL REACTION INTENSIFYING AGENT FOR USE THEREWITH

Stanford L. Adler, Monsey, N.Y., assignor to Technicon Corporation, Tarrytown, N.Y.

Filed Dec. 4, 1969, Ser. No. 881,971
Int. Cl. B03c *1/02*; G01n *11/00*, *33/16*
U.S. Cl. 23—253 R 11 Claims



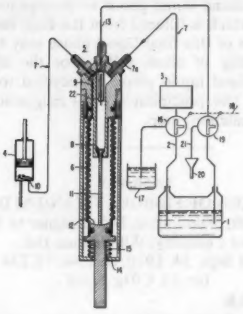
Apparatus for the determination of the coagulation rate or the like of fluids, wherein dispensing means are operable to successively dispense blood plasma samples, in turn and at a precisely metered rate, onto spaced-apart measured quantities or spots of a dried suspension of a reaction intensifying agent carried on an advancing film strip. The intensifying agent may comprise magnetic iron oxide particles. Subsequent to incubation of the sample-intensifying agent mixture, additional dispensing means are operable to dispense a precisely metered quantity of prothrombin reagent into the film strip. The resulting sample-reagent-intensifying agent mixture is subjected to rotating magnetic fields, with the result that the moving magnetic particles promote mixing and, also, are operative to collect one or more of the fibrin strands, whereby the mixture, which is substantially turbid, undergoes a sharp change in its optical transmission properties, which change is detected by light sensitive means for the measurement of the prothrombin time of the blood plasma sample of interest.

3,650,699

ANALYTICAL APPARATUS HAVING PRESSURE REGULATOR AND FLUSHING MEANS

Palle-Finn Beer, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Feb. 5, 1970, Ser. No. 8,966
Claims priority, application Sweden, Feb. 5, 1969, 1492/1969
Int. Cl. B01l *3/02*
U.S. Cl. 23—259 6 Claims



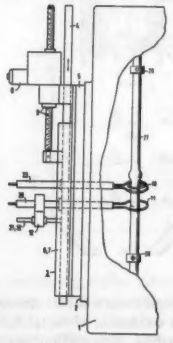
An apparatus for regulating the liquid pressure in a measuring pipette which comprises a measuring pipette, a pump, a pressure equalizer, a first means for conveying liquid for said pump to said pressure equalizer, a second means for conveying liquid from said pressure equalizer to said measuring pipette, said pressure equalizer comprising a variable volume chamber having an outlet communicating with said second means and an inlet communicating with said first means, valve means disposed in said variable volume chamber, said valve means communicating with said inlet and adapted to close when the variable volume chamber reaches a predetermined volume.

3,650,700

DEVICE FOR CRUCIBLE-FREE ZONE MELTING HAVING SEALING MEANS FOR A SLIDING MEMBER

Reimer Emeis; Joachim Haus, both of Ebermannstadt, and Wolfgang Keller, Pretzfeld, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 14, 1969, Ser. No. 790,985
Claims priority, application Germany, Jan. 16, 1968, P 17 19 512.9
Int. Cl. B01j *17/10*; E06b *7/16*
U.S. Cl. 23—273 SP 7 Claims



Device for crucible-free zone melting a crystalline rod substantially vertically supported at the ends thereof in a zone

melting chamber includes heating means extending into the chamber through a substantially vertical slot formed in a side wall of the chamber. Slide means located adjacent the side wall carries the heating means and is slidable therewith relative to the rod axis. Elastically deformable sealing means are mounted between the sliding surface of the slide means and the side wall and completely surround the slot so as to seal it gas-tightly. The slide means, at least at the sliding surface thereof, are formed of a material of good slidability, the sealing means are formed of a material effecting a dry seal with the sliding surfaces, the paired materials having a frictional coefficient of at most 0.2.

3,650,701

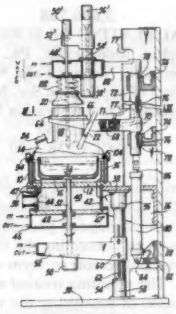
APPARATUS FOR GROWING CRYSTALLINE BODIES

Francis Forrat, Seyssinet, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed July 22, 1970, Ser. No. 57,139

Int. Cl. B01j *17/18*

U.S. Cl. 23—273 SP **8 Claims**



The apparatus comprises a gastight furnace locating a crucible which may be rotated by a motor located under the furnace. A rod vertically movable in a tubular extension of the furnace cover is adapted to pull a crystal from a melt in the crucible. The cover has a side arm which is pivotally connected to a lateral extension of a vertical shaft adapted to swing about its axis into a position where the crystal clears the furnace only after the shaft has been raised to a predetermined position. Additional pivotal movement of the side arm then provides access to the furnace body if necessary.

3,650,702

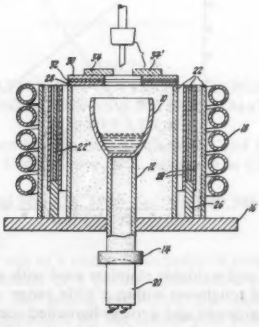
CRYSTAL GROWTH OF TETRAGONAL GERMANIUM DIOXIDE FROM A FLUX

Don E. Swets, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1970, Ser. No. 28,771

Int. Cl. B01j *17/18;* **C01g** *17/02*

U.S. Cl. 23—300 **6 Claims**



Highly pure single crystals of tetragonal germanium dioxide are grown from a melt containing germanium dioxide in which germanium atoms are octahedrally coordinated to oxygen. In addition to germanium dioxide, the melt includes an oxide of a monovalent metal from Group I of the Periodic Table of the Elements. In preferred embodiments alkali metal oxides are employed, particularly sodium oxide and lithium oxide.

3,650,703

METHOD AND APPARATUS FOR GROWING INORGANIC FILAMENTS, RIBBON FROM THE MELT

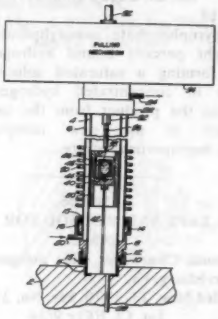
Harold E. Labelle, Jr., Quincy, and Abraham I. Mlavsky, Lexington, both of Mass., assignors to Tyco Laboratories, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 621,731, Feb. 14, 1967, abandoned.

Filed Sept. 8, 1967, Ser No. 666,304. The portion of the term of the patent subsequent to Mar. 14, 1988, has been disclaimed.

Int. Cl. B01j *17/18*

U.S. Cl. 23—301 **4 Claims**



Method of growing elongate essentially monocrystalline bodies of indefinite lengths and selected cross-sectional shapes from melts of selected high melting materials that melt congruently. Examples are filaments, ribbons and tubes of α -alumina.

3,650,704

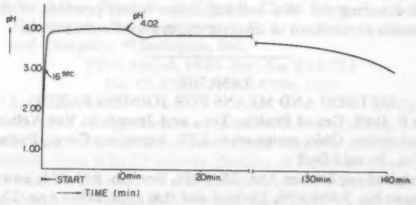
NOVEL SYNTHETIC HYDROTALCITE AND ANTACID COMPRISING SAID SYNTHETIC HYDROTALCITE

Teruhiko Kumura, 305, Yashima-Nishimachi; Norio Imataki, 25-8, 2-chome Tukuokamachi, both of Takamatsu-shi; Katuyuki Hasui, 1692, Konzaki, Sangawacho; Takeo Inoue, 297, Otoi, Zoda, Nagao-cho, and Kimiaki Yasutomi, 761, Zoda, Nagao-cho, all of Ohkawa-gun, Kagawa-ken, Japan

Continuation-in-part of application Ser. No. 654,977, July 21, 1967, now Patent No. 3,539,306. This application Jan. 6, 1970, Ser. No. 925

Int. Cl. G01f *5/00;* **C01f** *7/00;* **A61k** *27/00*

U.S. Cl. 23—315 **2 Claims**



A synthetic hydrotalcite having the composition expressed by the formula:

$$Al_2O_3 \cdot 6MgO \cdot CO_2 \cdot 12H_2O$$

and having substantially the following diffraction X-ray diffraction analysis:

d.Å 7.75, 3.89, 2.59, 2.30, 1.96, 1.53 and 1.50

said synthetic hydrotalcite containing heavy metal impurities in amounts of up to 30 p.p.m., being insoluble or substantially insoluble when treated with 1/10 N NaOH at 37° C. for 1 hour, having an acid consuming capacity of at least 240 ml./g, and being characterized by such properties that the time required for the artificial gastric juice to come to have a pH of higher than 3.0 is up to 30 seconds and time during which the pH of the artificial gastric juice is maintained above 3.0 is more than 120 minutes.

3,650,705

POTASSIUM PYROPHOSPHATE PEROXYHYDRATES AND METHOD OF PREPARING THE SAME

Helmut W. Majewski, Yonkers, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Aug. 21, 1968, Ser. No. 754,459
Int. Cl. C01b *15/00, 25/16*
U.S. Cl. 23—315 **1 Claim**

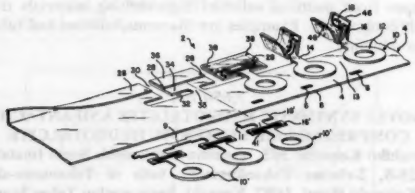
Potassium pyrophosphate peroxyhydrates containing at least 30 weight percent bound hydrogen peroxide are prepared by forming a saturated solution of potassium pyrophosphate in concentrated hydrogen peroxide and crystallizing out the product from the saturated solution. Also prepared is the new compound potassium pyrophosphate heptaperoxyhydrate.

3,650,706

TERMINAL TAPE AND METHOD FOR MAKING THE SAME

Stuart L. Parsons, Clearwater, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 23, 1970, Ser. No. 21,802
Int. Cl. H01r *9/14*
U.S. Cl. 29—193.5 **11 Claims**



Electrical terminal tape comprises a continuous carrier tape having pockets at spaced-apart intervals along one of its sides. Open barrel terminals, having contact portions, wire barrel portions, and insulation barrel portions, are carried by the tape. Insulation barrel portions are received in pockets and wire barrel portions and contact portions are supported on adjacent sections of tape. Upon crimping, the tape portions covering the wire and insulation barrel portions of the terminals are utilized to insulate the crimped connections.

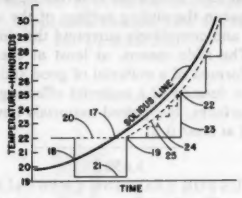
3,650,707

METHOD AND MEANS FOR JOINING PARTS

Dan P. Duff, Grand Prairie, Tex., and Joseph A. Van Velzor, Columbus, Ohio, assignors to LTV Aerospace Corp., Dallas, Tex., by said Duff

Original application Apr. 25, 1966, Ser. No. 551,824, now Patent No. 3,496,630. Divided and this application Apr. 22, 1969, Ser. No. 842,040
Int. Cl. B23p *3/10*
U.S. Cl. 29—194 **2 Claims**

A means for joining contiguous parts and comprising an alloy having a melting temperature lower than the parts to be joined and having dispersed therethrough solid, metallic particles which have a melting temperature higher than the alloy and which are diffusible into the alloy when the alloy is at or



near its melting temperature. Once the metallic particles have diffused into the alloy, the remelting temperature of the alloy is thereby raised.

3,650,708

METAL PLATING OF SUBSTRATES

William P. Gallagher, Monroeville, Pa., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 855,037, Sept. 3, 1969, now abandoned. This application Mar. 30, 1970, Ser. No. 23,967
Int. Cl. B23p *3/00*
U.S. Cl. 29—195 **40 Claims**

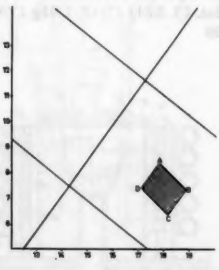
Substrates, particularly plastics, are plated with metals by pretreatment of the substrate with phosphorus sesquisulfide in an organic solvent to deposit phosphorus sesquisulfide at the surface, followed by containing the treated surface with a metal salt or complex thereof, to form a metal-phosphorus-sulfur compound. The resulting treated surface is either conductive or is capable of catalyzing the reduction of a metal salt to produce a conductive surface. Such conductive surfaces are readily electroplated by conventional techniques.

3,650,709

FERRITIC, AUSTENITIC, MARTENSITIC STAINLESS STEEL

Lars Johan Gustaf Morsing, Avesta, Sweden, assignor to Avesta Jernverks Aktiebolag, Avesta, Sweden

Continuation-in-part of application Ser. No. 856,872, July 3, 1969, which is a continuation of application Ser. No. 558,998, June 20, 1966, now abandoned. This application Oct. 13, 1969, Ser. No. 871,396
Int. Cl. B32b *15/00;* **C22c** *39/20*
U.S. Cl. 29—196.1 **3 Claims**



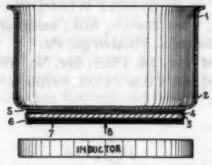
Rollable and weldable stainless steel with a high degree of tension and toughness within a wide range of temperatures both in a hardened and a tough-hardened condition comprising 5–15 percent by weight of ferrite, 10–40 percent by weight of austenite and the remainder tempered martensite.

3,650,710

ELEMENT WITH A LAMINATED METAL STRUCTURE

Jacques J. D. Doucerain, Massy, France, assignor to Societe de Traitements Electrolytiques et Electrothermiques (S.T.E.L.)

Filed Sept. 24, 1969, Ser. No. 860,727
Claims priority, application France, Sept. 25, 1968, 167577; Nov. 5, 1968, 172607
Int. Cl. B32b *15/18, 15/20*
U.S. Cl. 29—196.2 11 Claims



The problem of manufacturing heat-resistance elements with a laminated structure, comprising a plate of a metal having a comparatively low melting point, aluminum for example, is solved through coating this plate with a film of another metal having both a higher melting point and a high mechanical resistance allowing the holding in position of the aluminum plate when the latter is in the molten state. The aluminum plate can thus be brazed to another plate by means of a high temperature, and therefore reliable brazing, using a soldering metal or alloy whose melting point is higher than that of the aluminum.

3,650,711

FUEL COMPOSITION

Alvin J. Unick, Baton Rouge, La., and Richard G. Abowd, Jr., Farmington, Mich., assignors to Ethyl Corporation, New York, N.Y.

Filed Mar. 14, 1969, Ser. No. 807,418
Int. Cl. C10l *9/00, 11/00*
U.S. Cl. 44—1 R 23 Claims

Disclosed herein are compositions of matter having valuable combustion properties. The compositions are particularly desirable in combinations having enhanced ignition and continued combustion properties in forms based on natural source and manmade (reconstituted) firewood and briquettes for heating, cooking and the like. The compositions involved contain mixtures of straight chain and branched chain olefins and paraffins of selected molecular weight with preference for the co-presence of higher alcohols, the latter being particularly effective components for purposes of enhancing the fabrication and burning characteristics of some of the compositions.

3,650,712

COMBINATION OF POLYVINYL ALCOHOL AND GELLING AGENT AS A BINDER IN MATCH FORMULATIONS

Ronald Raymond Martin, Melrose Park, Ill., and John Russell Danner, Jr., Cedar Grove, N.J., assignors to CPC International Inc.

Filed Mar. 21, 1969, Ser. No. 809,366
Int. Cl. C06f *3/00*
U.S. Cl. 44—42 13 Claims

A binder for use in a match formulation is revealed which comprises a mixture of a gelling agent and a polyvinyl alcohol wherein the gelling agent-polyvinyl alcohol binder serves as a replacement for the animal glue binder conventionally used in the formulation of matches.

3,650,713

STEAM REFORMING OF HYDROCARBONS

Godfrey Charles Chinchen, and Thomas Cecil Hicks, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 12, 1970, Ser. No. 36,690
Claims priority, application Great Britain, May 20, 1969, 25,627/69
Int. Cl. C01b *2/14*; B01j *11/06*
U.S. Cl. 48—214 8 Claims

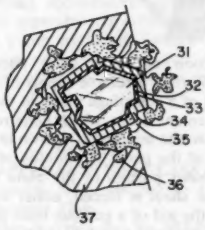
A continuous process of steam reforming hydrocarbons with decreased carbon-lay-down is carried out over a substantially alkali-free catalyst comprising nickel or cobalt metal and the dioxide of zirconium on a pre-formed refractory support.

3,650,714

METHOD OF COATING DIAMOND PARTICLES WITH METAL

Peter Farkas, Milford, N.H., assignor to Permattach Diamond Tool Corporation, Milford, N.H.

Filed Mar. 4, 1969, Ser. No. 804,144
Int. Cl. B24b *1/00*
U.S. Cl. 51—295 7 Claims



Titanium (or zirconium) coated single diamonds have high cohesion bonding between coating and diamond and have external surfaces adhesion-receptive to subsequently applied less oxidizable metal, resin, and ceramic coatings which permit the double coated particles to be mounted at elevated temperatures in or on extraneous supports with or without application of pressure, without loosening the cohesion bonding and without resort to nonoxidizing atmospheres; or permitting them to be directly mounted in nonoxidizing atmospheres, in either case providing long life support for single or multiple diamond arrays as in cutting and abrading implements.

3,650,715

ABRASIVE COMPOSITIONS

Dieter Klaus Brushek, and Frank Clyde Starr, Jr., both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1969, Ser. No. 813,754
Int. Cl. C08g *51/12*; C09c *1/68*
U.S. Cl. 51—298 11 Claims

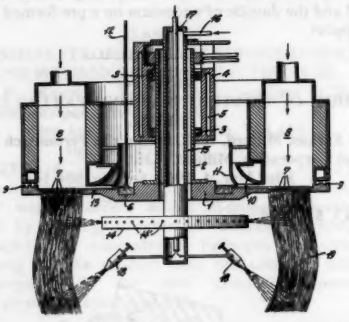
Abrasive compositions and articles such as grinding wheels and hones formed therefrom which abrasive compositions contain from 6 to 35 volume percent of diamonds from 5 to 65 volume per cent of a dendritic form of a metal such as copper, or silver or alloys thereof, from 10 to 75 volume percent of a coalesced aromatic polyimide and up to 80 volume percent (but retaining the 10 volume percent minimum of polyimide) of the polyimide phase of a filler or a metal coating on the diamonds.

3,650,716

METHOD OF AND APPARATUS FOR THE PRODUCTION OF FIBERS FROM THERMOPLASTIC MATERIALS, PARTICULARLY GLASS FIBERS

Daniel Brossard, Sarcelles, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Sept. 2, 1969, Ser. No. 854,369
Claims priority, application France, Sept. 6, 1968, 165317
Int. Cl. C03b 37/04
U.S. Cl. 65—6 26 Claims



The production of fibers from viscous thermoplastic material by collecting a reserve supply of the material at the central portion of a centrifuge plate, in the form of a disc or the bottom of an enclosure, which plate rotates on a vertical axis, where from the material is thrown in sheet form toward the periphery of the plate. A plurality of openings are provided in the outer portion of the plate through which the material of the sheet is forced, either by centrifugal force alone or with the aid of a gaseous blast acting on the top of the sheet, which serves to subdivide the material into a plurality of primary filaments to be drawn out into fine fibers. Additional attenuating blasts for drawing out the fibers, and blowers for directing the fibers may be used for effecting their withdrawal.

3,650,717

APPARATUS FOR MEASURING TENSION IN GLASS FIBER MAKING

Sheldon A. Canfield, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Original application Apr. 8, 1968, Ser. No. 719,632, now Patent No. 3,526,130, dated Sept. 1, 1970. Divided and this application Aug. 14, 1969, Ser. No. 850,023
Int. Cl. G01l 5/10; C03b 37/02
U.S. Cl. 65—11 W 4 Claims

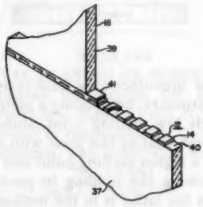
This invention pertains to an apparatus for producing glass fibers which includes a bushing having openings, a winder, and an elongated member positioned to engage a strand located between the bushing and winder. This member is extended and flexible and bends upon engagement with a moving strand setting up a stress in the member which raises the resistance of the member. The resistance is measured by a bridge and a signal is sent to the winder which may stop the winder or regulate the speed of the winder in response to the strain of the member.

3,650,718

FUSION METHOD FOR SPACED CONDUCTIVE ELEMENT WINDOW

Jon W. Ogland, Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1969, Ser. No. 876,767
Int. Cl. C03c 19/00, 19/00, 15/00
U.S. Cl. 65—23 6 Claims



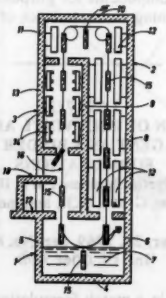
A display device in which a cathode ray tube envelope is utilized with a plurality of conductive elements extending from the interior surface of the faceplate of the cathode ray to the exterior surface of the cathode ray tube. A high resolution faceplate is provided by fabricating the faceplate in a manner such that the conductive elements are formed on a surface transverse to the inner and outer surfaces of the faceplate and this transverse surface is then formed into the faceplate to provide a vacuum type window.

3,650,719

CHEMICAL AND THERMAL TEMPERING OF VITREOUS MATERIALS

Robert Van Laethem, Les Morlaires, Belgium, assignor to Glaverbel S. A., Watermael, Boitsfort, Belgium

Filed Apr. 26, 1968, Ser. No. 724,336
Claims priority, application Luxembourg, Apr. 27, 1967, 53,546; Great Britain, Feb. 8, 1968, 6,390/68
Int. Cl. C03c 17/00
U.S. Cl. 65—30 11 Claims



A process for treating vitreous materials to temper them which includes first chemically and then thermally tempering such materials.

3,650,720
DECORATING GLASS-CERAMIC ARTICLES

Peter Grego, Corning; Theodore R. Kozlowski, Horseheads, and Peter M. Schuyler, Otego, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 14, 1969, Ser. No. 877,053
Int. Cl. C03c *15/00, 17/00*
U.S. Cl. 65—30 1 Claim

This invention relates to the decorating of Li_2O and/or Na_2O-containing glass-ceramic articles through the stain coloring thereof utilizing copper and/or silver ions, these articles being subsequently chemically strengthened through an ion exchange reaction of the large-ion-for-small-ion type carried out in a bath of molten salt. More specifically, the present invention is concerned with the prevention of unsightly defects which can occur in the stain coloring during the chemical strengthening process. This is accomplished by passing sulfur dioxide gas through the bath of molten salt.

3,650,721
METHOD OF FORMING MICRO-POROUS GLASS FIBERS

Joseph J. Hammel, Pittsburgh, Pa., and John D. Mackenzie, Schenectady, N.Y., assignors to PPG Industries, Inc., Pittsburgh, Pa.

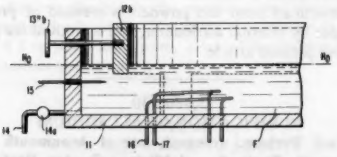
Continuation-in-part of application Ser. No. 736,670, June 13, 1968, now abandoned. This application May 6, 1969, Ser. No. 822,325
Int. Cl. C03c *25/06*
U.S. Cl. 65—31 6 Claims

This invention relates to a process for forming small particles of microporous glass having inter-connected pores suitable to filter tobacco smoke. It particularly relates to a method of melting a phase-separable borosilicate glass composition, especially alkali borosilicates, forming the glass into a workable form, especially fibers, at elevated temperatures, phase separating the glass by heat treatment at elevated temperatures below the miscibility temperature of the glass for a sufficient period to form a silica-rich phase and a substantially continuous borate-rich phase, cooling the phase-separated glass, sizing the phase-separated glass, and leaching the glass to remove a sufficient quantity of the borate-rich phase to form microporous articles having inter-connected pores.

3,650,722
METHOD AND APPARATUS FOR FORMING BLANKS IN OPTICAL-QUALITY HOMOGENEOUS GLASS

Roger R. Genisson, Fontainebleau, and Jean Pierre A. Thibieroz, Montigny sur Loing, both of France, assignors to Societe des Verreries Industrielles Reunies du Loing, Levallois Perret, France

Filed June 26, 1970, Ser. No. 50,209
Int. Cl. C03b *29/00*
U.S. Cl. 65—65 A 5 Claims

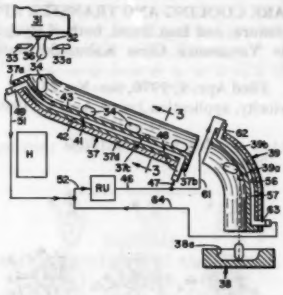


A method for casting blanks of optical-quality glass disks in which the glass is cast on a bath of metallic material. The height of the metal material is varied during casting to ensure a constant distance between the casting tube and the top of the forming disk. Also during casting controllable heating and cooling means immersed within the bath of metallic material maintain a proper casting temperature at the top of the bath.

3,650,723
GLASS GOB DELIVERY

Robert F. Wiley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,605
Int. Cl. C03b *39/00*
U.S. Cl. 65—169 1 Claim

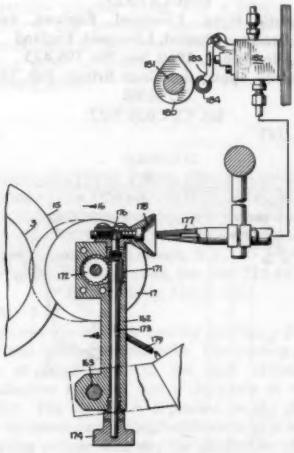


Method of and apparatus for delivering gobs of molten glass to glass forming apparatus at substantially identical rates of speed, such apparatus and method comprising a sloping trough having a gob contacting surface arranged to be cooled below freezing temperature of water, and supplying a coolant or cooling medium to said trough to form frost on said surface.

3,650,724
CRACK-OFF APPARATUS FOR GLASS ARTICLES

John S. Lush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Dec. 8, 1969, Ser. No. 882,969
Int. Cl. C03b *9/46, 23/00, 21/00*
U.S. Cl. 65—174 8 Claims



Apparatus for manufacturing glass tumblers or other glass articles which is positioned in a manufacturing line to receive the glass articles after they have been shaped by a forming machine and to complete the articles by cracking-off unwanted portions. The machine includes an aligning and feeding means, a main crack-off turret, and annealing and cooling means. The articles are fed in upright position to the crack-

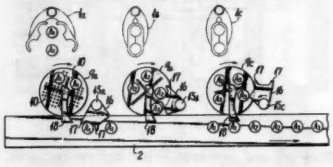
off turret and the unneeded portion or moil is cracked-off or removed from the lower portion of the article by a combined heating and impacting operation. After the moil is removed on the turret, the newly formed edges of the glass vessel are smoothed or polished and the article is then tempered and cooled.

3,650,725

GLASSWARE COOLING AND TRANSFER APPARATUS

Akihiro Okumura, and Isao Izumi, both of Hyogo, Japan, assignors to Yamamura Glass Kabushiki Kaisha, Hyogo, Japan

Filed Apr. 9, 1970, Ser. No. 27,057
Claims priority, application Japan, Aug. 13, 1969, 44/64346; 44/64347
Int. Cl. C03b *35/00*
U.S. Cl. 65—260 **3 Claims**



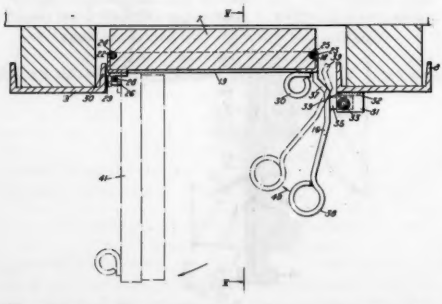
Articles of glassware manufactured by an automatic apparatus are taken out from finishing molds of the apparatus and held temporarily by take-out assemblies until they are cooled to such temperature that they no longer undergo deformation. The articles, then placed onto turntables in rotation and further cooled thereon, are transferred, in equidistant arrangement, onto a belt conveyor which is driven at a velocity higher than the rotational speed of the turntable by means of delivery arms adapted to be rotated at a progressively increasing velocity.

3,650,726

GLASS MELTING FURNACES HAVING HINGED FLOOR INSULATION

William Christie Hynd, Liverpool, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Feb. 4, 1969, Ser. No. 796,423
Claims priority, application Great Britain, Feb. 16, 1968, 7,790/68
Int. Cl. C03b *5/22*
U.S. Cl. 65—347 **4 Claims**



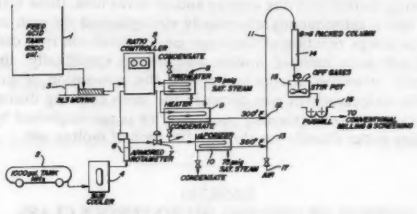
A glass melting furnace has an array of blocks of thermal insulation material beneath its floor extending beneath the whole of the floor of the furnace, and has a hinged mounting for each block for moving each block from an inoperative position to an insulating position where it is locked facing the undersurface of the furnace floor, thereby providing selective insulation of the furnace floor.

3,650,727

AMMONIUM POLYPHOSPHATE IMPROVEMENT

John L. Kolbe, Clarksville, and Casimer C. Legal, Jr., Elkridge, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,571
Int. Cl. C05b *7/00*
U.S. Cl. 71—34 **7 Claims**



Hydrolysis of ammonium polyphosphate can be significantly delayed and reduced when the hot freshly made ammonium polyphosphate reaction mixture, still under pressure, is passed through a column containing an inert packing.

3,650,728

COMBATING PIGWEED IN SUGAR BEET FIELDS

William C. Doyle, Jr., Leawood, and James L. Ahle, Shawnee, both of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 18, 1969, Ser. No. 886,402
Int. Cl. A01n *9/22*
U.S. Cl. 71—88 **3 Claims**

Pigweed is combated in sugar beet fields by applying postemergently to the locus of the pigweed a herbicidally effective amount of a composition comprising one part by weight of methyl 3-(N'-m-tolylcarbamoyl)carbanilate and from one-fourth to two parts by weight of 2-(m-chlorophenyl)-4H-3,1-benzoxazin-4-one.

3,650,729

INTERNALLY NITRIDED STEEL POWDER AND METHOD OF MAKING

Lynn E. Kindlimann, Natrona Heights, Pa., and George S. Ansell, Latham, N.Y., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1969, Ser. No. 805,361
Int. Cl. B22f *3/12, 9/00*
U.S. Cl. 75—0.5 BC **34 Claims**

The application describes a steel powder containing as a dispersoid therein particles of metal nitride having a free energy of formation of greater than about −21,000 cal./mole, said nitride particles being present at an interparticle spacing of less than about 2 microns. Also described is a hot pressed article produced from the powder, a method of producing the powder by internal nitridation, and a method for producing the hot pressed article.

3,650,730

PURIFICATION OF ALUMINIUM

Leslie Jack Derham, deceased, late of Avonmouth Works, Avonmouth, England, and Michael Gordon Derham, administrator, Henleaze, Bristol, England, assignors to Alloys and Chemicals Corporation, Cleveland, Ohio

Filed Mar. 21, 1969, Ser. No. 810,086
Claims priority, application Great Britain, Mar. 21, 1968, 13,643/68
Int. Cl. C22b *21/06, 9/10, 9/12*
U.S. Cl. 75—68 **15 Claims**

A process for removing impurities from aluminum or aluminum alloys comprising treating the molten metal with a

chloridizing agent while the metal is covered with a layer of molten flux, so as to suppress the emission of fumes from the molten metal. An improved aspect of such process wherein the flux contains at least part of the chloridizing agent.

3,650,731
FERRITIC STAINLESS STEEL
George Aggen, Sarver, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.
Filed Jan. 31, 1969, Ser. No. 795,740
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 T 2 Claims

A hot rolled ferritic stainless steel having up to 0.07% carbon, 10–12.5% chromium, traces to 0.75% silicon, traces to 3% manganese, traces to 2% copper, 0.5 to 1.5% nickel, 0.1 to 0.5% titanium and which may contain as small alloying additions aluminum, vanadium, zirconium, columbium or combinations thereof. The elements of the steel are also balanced with respect to each other so that it is capable of being softened to R_B80 hardness or lower in less than about 24 hours of subcritical box annealing and develops at least 50% austenite during hot rolling so as to exhibit a charpy V-notch impact strength of at least 20 ft.-lb. at 0° F.

3,650,732
PROCESSING OF FERROPHOSPHORUS
Milton J. Scott, and Jurgen A. Stenzel, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Oct. 17, 1969, Ser. No. 867,398
Int. Cl. C22c *33/00*; C01b *25/08*
U.S. Cl. 75—129 5 Claims

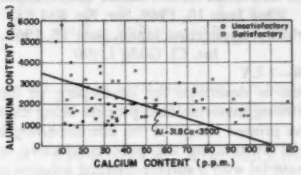
Ferrophosphorus is heated in admixture and excess aluminum to convert the phosphorus therein to aluminum phosphide. The aluminum phosphide is hydrolyzed and an alloy comprising the nonphosphorus constituents of the ferrophosphorus and unreacted aluminum is separated from the hydrolysis products. The alloy of non-phosphorus constituents and aluminum is useful in the metallurgical industry and the phosphine obtained during the hydrolysis reaction has well-known utility as a chemical intermediate, for example, in preparing gasoline additives such as tributyl phosphine.

3,650,733
NONMAGNETIC COPPER-BASED ALLOY
Alexei Vasilievich Bobylev, ulitsa Arkhitektora vlasova 41; Kapitolina Arsenievna Goryacheva, ulitsa 3a, korpus 1, kv. 73, and Alla Vasilievna Chernikova, Otkrytoe shosse, 21 korpus 2, kv. 113, all of Moscow, U.S.S.R.
Filed Aug. 17, 1970, Ser. No. 64,565
Int. Cl. C22c *9/06*, *9/00*
U.S. Cl. 75—153 1 Claim

The present invention relates to nonmagnetic copper-based alloys applicable in the apparatus for magnetic tape recording and playback. The alloy contains 4.5 to 4.9% nickel, 4.5 to 4.9% aluminum, 2.5 to 3% manganese, 0.7 to 1% chromium and copper.

3,650,734
WROUGHT WELDING ALLOYS
Thomas A. Kantor, Pittsburgh, and Ronald K. Bowen, Bethel Park, both of Pa., assignors to Cyclops Corporation, Universal-Cyclops Specialty Steel Division, Pittsburgh, Pa.
Filed June 16, 1969, Ser. No. 833,464
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 4 Claims

A welding alloy and a method of making same containing a controlled amount of aluminum and calcium, for example, as represented by the formula Al + 31.8 Ca < 3,500 where the compositions are given in parts per million for the elimination of fusion zone undercutting during the welding of said alloy.



3,650,735
TIN BASE ALLOY CONTAINING ALUMINUM, ZINC AND COPPER
Luigi Monaco, 270 Amityville Street, Islip Terrace, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,716
Int. Cl. C22c *13/00*
U.S. Cl. 75—175 R 2 Claims

An alloy for a jewelry metal consisting of at least 50 percent tin, and aluminum, zinc and copper, has high brightness and improved tarnish resistance.

3,650,736
METHOD OF MOLDING ELECTRODES
Robert F. Broom, Villa Park, Ill., assignor to Amforge, Inc., Chicago, Ill.
Filed Sept. 9, 1968, Ser. No. 758,624
Int. Cl. B22f *3/12*
U.S. Cl. 75—200 18 Claims

An improved method of molding electrodes for use in electrical discharge machining comprising mixing various powdered materials together along with a binder, molding the same under a low pressure, and thereafter sintering the molded compound at a temperature approximately equal to the melting point of that one of the powders having the lowest melting point.

3,650,737
IMAGING METHOD USING PHOTOCONDUCTIVE ELEMENT HAVING A PROTECTIVE COATING
Leon I. Maissel; Bernt Narken, and Brian Sunners, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 25, 1968, Ser. No. 715,657
Int. Cl. G03g *13/22*, *5/02*
U.S. Cl. 96—1 PC 2 Claims

A transparent, protective coating overlies a photoconductive layer and is integral therewith. The coating, which has a resistivity at least equal to the dark resistivity of the photoconductive material, has a thickness in the range of 50A–4000A. The coating is deposited on the photoconductive layer by sputtering through utilization of a high frequency alternating voltage whereby the properties of the coating may be controlled. When applying the high frequency alternating voltage, the power is kept low to produce a relatively high compressive stress of the coating. Controlling the power results in controlling the compressive stress of the coating. The temperature of the photoconductive layer may be maintained at a sufficiently low temperature so that the photoconductive layer retains its photoconductive properties.

3,650,738

PROCESS FOR DEVELOPING AN ELECTROPHOTOGRAPHIC PRINTING MATERIAL

Itsuo Ikeda, and Nobuyuki Katagiri, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed June 10, 1969, Ser. No. 831,933
Claims priority, application Japan, June 15, 1968, 43/41228
Int. Cl. G03g *13/00*
U.S. Cl. 96—1 LY 3 Claims

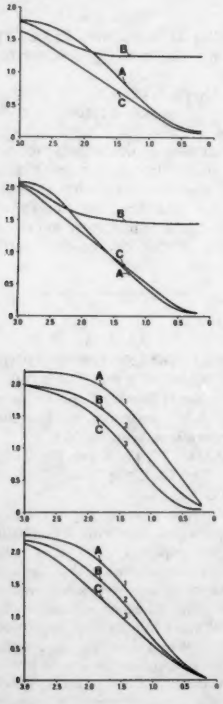
A process is described for developing an electrophotographic printing material, said process being capable of improving the printed image of the electrophotographic printing material by treating the photoconductive layer of the printing material with a surface-treating solution prepared by dissolving a two- or multi- component copolymer in paraffinic hydrocarbon, said copolymer containing at least one monomer selected from each of the following first and second group of monomers, the first group of monomers having an oleophilic group and the second group of monomers having a basic nitrogen atom.

3,650,739

SILVER DYE BLEACH PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR THEIR USE

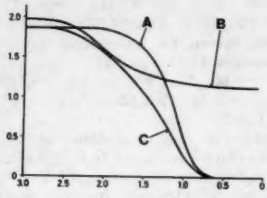
Max Marthaler, Marly-le-Petit, and Alfred Oetiker, Fribourg, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed July 20, 1970, Ser. No. 56,597
Claims priority, application Switzerland, July 25, 1969, 11441/69
Int. Cl. G03c *5/52, 7/00*
U.S. Cl. 96—20 13 Claims



A process for the manufacture of a photographic color image by the silver dyestuff bleaching process is provided. The photographic material used in this process comprises on a support at least one silver halide emulsion layer containing a diffusion-resistant bleachable image dyestuff and immediately on top of said layer on the side facing the light source, a silver halide emulsion layer free of image dyestuff. After imagewise exposure this material is processed in the presence of a dyestuff bleaching catalyst to give a color image. The color image is produced exclusively through image dyestuffs present in the photographic material prior to the exposure.

By the present process color images are obtained wherein the gradation, sensitivity and spectral distribution of the sensitivity have been favorably influenced.



3,650,740

TRANSFER OF SHEET-LIKE MATERIAL

August Jean Van Paesschen, Antwerpen, and Lucien Jan Baptist Van Gossum, Kontich, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed May 31, 1968, Ser. No. 733,313
Claims priority, application Great Britain, June 1, 1967, 25,418/67
Int. Cl. G03c *11/12;* B44c *31/00*
U.S. Cl. 96—28 4 Claims

Visible image-shaped regions of colloid material in a thin layer are transferred from a temporary support to a permanent support by means of a chemically hardenable adhesive applied as a liquid coating between the colloid material to be transferred and the permanent support and allowed to harden so that the temporary support can be peeled away. The visible image-shaped regions of the colloid material can form part of an overall layer or the non-image portions of such layer can be removed in advance. A preferred colloid layer is constituted of solid hydrophobic thermoplastic polymer particles dispersed in a hydrophilic binder in a weight ratio greater than 1:1 and a preferred hardenable adhesive is an epoxy resin in liquid state having a viscosity of 8,000 to 20,000 cp. which is applied to at least the pattern on the temporary support carrying the colloid layer thereon and permeates the colloid layer so that upon hardening of such resin, improved resistance to wear, humidity and heat is imparted to the colloid.

3,650,741

SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Camille A. Vandeputte, Mortsel, and Paul Desire Van Pee, Edegem, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Mar. 25, 1968, Ser. No. 715,551
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 R 16 Claims

An improved silver complex diffusion transfer copy image is obtained when for purposes of better sensitivity and/or continuous-tone reproduction, a silver bromide or silver bromo-iodide emulsion is utilized as the light-sensitive emulsion from which diffusion transfer takes place, by forming the diffusion transfer image in the presence of a quaternary

phosphonium salt wherein three of the quaternary substituents are aryl groups and the fourth is an alkyl group. Known diffusion transfer additives, especially the tetrazoline-5 thiones and certain water soluble amines are preferably used together with the phosphonium salt.

3,650,742

OLEOPHILIZING GELATINOUS IMAGES

Doyle O. Etter, and Anthony J. Parrinello, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 1, 1968, Ser. No. 741,758
Int. Cl. G03f 7/02
U.S. Cl. 96—33 3 Claims

Gelatinous images, especially lithographic materials having gelatinous images on metallic supports, for example, aluminum, are heated, for example, at 500° F. for 5 minutes, to render the gelatinous images durably oleophilic.

3,650,743

METHODS FOR MAKING LITHOGRAPHIC OFFSET PLATES BY MEANS OF ELECTROMAGNETIC RADIATION SENSITIVE ELEMENTS

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich. Continuation-in-part of Ser. No. 673,410 Oct. 6, 1967, abandoned.

Filed Aug. 14, 1969, Ser. No. 850,184
Int. Cl. G03f 7/02
U.S. Cl. 96—33 3 Claims

Methods for making lithographic offset plates and the like by means of electromagnetic radiation sensitive elements comprising essentially a metallic layer or a layer of silicon, a layer of an inorganic material capable when exposed to electromagnetic actinic radiation to form an interreaction product with the metallic layer, and a support member. The methods consist of exposing the radiation sensitive elements to an actinic image projected thereon for causing selective and discrete interreaction between silicon or the metal or metals of the first layer and the inorganic material, such reacted portions having hydrophilic or oleophilic qualities different from the unreacted portions of the elements.

3,650,744

ETCHING METHOD USING PHOTOPOLYMERIZABLE VAPORS AS THE PHOTORESIST

Charles O. Kunz, Ballston Lake, and Parley C. Long, Bridgewater, both of N.Y., assignors to General Electric Company

Filed Mar. 2, 1970, Ser. No. 15,678
Int. Cl. G03c 5/00
U.S. Cl. 96—35.1 8 Claims

An etching method is provided utilizing an organic solvent soluble photosensitive photopolymerized organic film on the surface of an etchable substrate as a negative photoresist. The organic film is applied by effecting the ultraviolet surface photopolymerization of a photopolymerizable organic material in vaporous form, such as hexachlorobutadiene at substrate temperatures below about 100° C. The method allows for the production of composites having continuous and imperforate films having thicknesses as low as 500 Angstroms, which can be employed as negative photoresists and also provide dielectric layers.

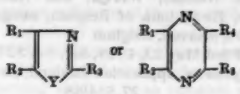
3,650,745

PRINTING PLATE CARRYING A PHOTOACTIVE LAYER

Ernst-August Hackmann, Wiesbaden-Dotzheim, and Erwin Lind, Auringen uber Wiesbaden, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Aug. 28, 1968, Ser. No. 755,807
Claims priority, application Germany, Aug. 31, 1967, P 15 97 784.1
Int. Cl. G03c 1/70
U.S. Cl. 96—35.1 21 Claims

This invention relates to a photoactive layer, particularly adapted for use in the preparation of printing plates, which comprises a compound corresponding to one of the following general Formulae



wherein:

R_1 and R_2 which may be identical or not, are aryl or heteroyl groups which may be substituted, or form members of an aromatic or pyridine ring.

R_3 is —CH CH_2 or —RCH CH_2, with R being arylene, naphthylene, or heteroylene,

R_4 is either identical with R_3, or is an aryl or heteroyl group which may be subsituted, and is NH, S, Se, or O.

3,650,746

DUAL IMAGE FORMATION ON SEPARATE SUPPORTS OF PHOTOCURABLE COMPOSITION

Robert J. Bailey, College Park, Md., assignor to W. R. Grace & Co

Filed June 16, 1969, Ser. No. 833,723
Int. Cl. G03c 5/00
U.S. Cl. 96—35.1 14 Claims

This invention is directed to forming two silverless continuous tone photographic images from a sandwich comprising two UV transparent outer support layers and a pigment or dye filled photosensitive composition as the inner layer by exposing said composition to actinic radiation e.g., UV light through image-bearing transparencies adjacent each outer support layer to selectively insolublize the UV exposed areas of said composition, peeling said outer support layer apart and removing soluble portions of the composition in the unexposed areas thereby forming a silverless, continuous tone, photographic image on each outer support layer.

3,650,747

ELECTROLESS DEPOSITION OF NICKEL, COBALT, COPPER OR IRON METAL AND A BISMUTH, ANTIMONY, LEAD, TIN, TITANIUM, TUNGSTEN OR CHROMIUM SALT ON A GOLD, PLATINUM OR PALLADIUM LATENT IMAGE

Ennio Calligaris; Roy Callaby, and Mario Rossello, all of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company

Filed Jan. 31, 1969, Ser. No. 795,708
Int. Cl. G03c 5/24
U.S. Cl. 96—48 5 Claims

Salts of bismuth, antimony, lead, tin, gold, silver, titanium, tungsten and chromium are employed to impart continuous tone characteristics to image reproductions produced by the electroless deposition of a non-noble metal onto a recording medium.

3,650,748

PHOTOGRAPHIC REPRODUCTION USING NOVEL PHYSICAL DEVELOPERS

Joseph S. Yudelson, and Barbara F. Dernbach, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1968, Ser. No. 778,323
Int. Cl. G03c 5/24, 1/64
U.S. Cl. 96—48 PD 30 Claims

Processes for producing images by photoexposure, and stable physical developers employing borane reducing agents for use in such processes are described.

3,650,749

PHOTOGRAPHIC DEVELOPMENT

Jozef Frans Willems, Wilrijk, and Antoon Leon Vandenberghe, Hove, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed May 23, 1969, Ser. No. 827,145
Claims priority, application England, June 10, 1968, 27,524/68
Int. Cl. G03c 5/30
U.S. Cl. 96—66 12 Claims

Photographic silver halide elements are described which comprise incorporated in a silver halide emulsion layer or another water-permeable colloid layer a hydroquinone silver halide developing agent precursor of which at least one of the hydroxyl groups of said hydroquinone has been esterified to form a hydrolyzable aliphatic acyloxy radical comprising a quaternary ammonium group. Upon treatment of the exposed elements with an alkaline solution the developing agent precursor hydrolyzes readily to yield the active developing agent so that no delay in development occurs. The resulting developed images are free from spots, do not show fog and possess the desired sensitivity and gradation with normal or even shorter length of development time.

3,650,750

HEAT-DEVELOPABLE DIAZO-TYPE LIGHT-SENSITIVE MATERIAL

Susumu Iwata, Tokyo, and Etuo Oida, Yokohama-shi, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 23, 1969, Ser. No. 887,758
Claims priority, application Japan, Dec. 28, 1968, 44/781
Int. Cl. G03c 1/60, 1/58
U.S. Cl. 96—75 4 Claims

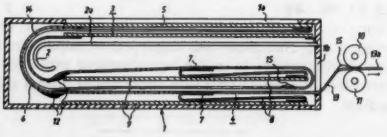
A heat-developable diazotype light-sensitive material is provided which gives a high density of dye-image. This light-sensitive material may be produced by applying to a substrate a solution containing a diazonium compound and a derivative of polyhydroxybenzoic acid dissolved in an aqueous solution which contains a salt of an alkali metal (Na), an alkaline earth metal (Ca and Mg) or a weak acid having an electric dissociation exponent more than 2.0.

3,650,751

PHOTOGRAPHIC FILM PACK

Hans-Peter Huber, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 19, 1968, Ser. No. 785,277
Claims priority, application Germany, Sept. 26, 1968, P 15 97 098.6
Int. Cl. G03c 1/48
U.S. Cl. 96—76 C 25 Claims



Successive film units which are stored in the container of a photographic film pack for use in a camera which develops the film are connected to each other by flexible coupling strips each of which automatically passes between the pressure applying rolls of the camera in response to withdrawal of the preceding film unit. The leading ends of coupling strips are weakened so that they can be readily separated from preceding film units. Such separation is further facilitated by transversely extending or inclined beads provided on the coupling strips and engaging with the pressure applying rolls during separation of respective coupling strips from the preceding film units.

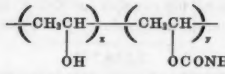
3,650,752

WHITENED PHOTOGRAPHIC PRINTING PAPER

Hiroyuki Amano; Nobuo Tsuji; Takushi Miyazako; Kazuo Shirasu, and Yosinori Tutiya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., A. higara-Kamigun, Kanagawa, Japan

Filed May 12, 1970, Ser. No. 36,525
Claims priority, application Japan, May 12, 1969, 44/36404
Int. Cl. G03c 1/92
U.S. Cl. 96—82 14 Claims

A photographic printing paper comprising a support having thereon a light-sensitive silver halide emulsion layer containing a water-soluble fluorescent brightening agent and a partially urethanated polyvinyl alcohol having the following recurring structure:



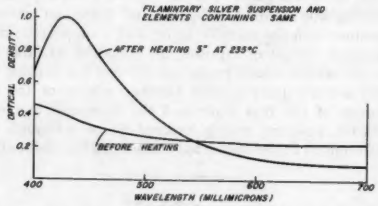
wherein $x+y$ is a number from 100 to 5,000 and $y/(x+y)$ is a number from 0.05 to 0.25.

3,650,753

FILAMENTARY SILVER SUSPENSIONS AND ELEMENTS CONTAINING SAME

Robert Elwin Bacon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,584
Int. Cl. G03c 1/84
U.S. Cl. 96—84 9 Claims



This invention relates to photographic elements having at least one layer which contains a filamentary silver suspension and to processes of heating elements containing said suspensions to change the adsorption characteristics thereof. Elements containing uniform coverage layers of filamentary suspensions can be heated to temperatures of at least 150° C. to reduce the light adsorption over at least one third of the visible light spectrum. Antihalation layers for heat-processable elements can be provided by utilization of the filamentary silver suspension in said elements.

3,650,754

PHOTORESIST COMPOSITIONS CONTAINING LIMED ROSIN AND PHOTOACTINATOR

Viron V. Jones, Caldwell, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed July 31, 1969, Ser. No. 846,616
Int. Cl. G03c 1/00, 1/68
U.S. Cl. 96—88 9 Claims

A layer of limed rosin sensitized with a photoactive dye or a photosensitive organic polyhalogen compound is normally hydrophobic, but is rendered soluble in weakly alkaline aqueous solution upon exposure to light. When over-coated upon a hydrophilic base sheet these limed rosin materials provide aqueous-developable, positive-working lithographic printing plates, or when coated upon film layers soluble in aqueous solutions they provide for aqueous-developable reproduction sheets by means of etching processes.

3,650,755

POSITIVE-MODE PHOTOGRAPHIC PROCESS AND COMPOSITION

Yoshikazu Yamada, Sierra Madre, and Thomas H. Garland, El Monte, both of Calif., assignors to Bell & Howell Company

Continuation-in-part of application Ser. No. 523,705, Jan. 28, 1966, now Patent No. 3,503,745, dated Mar. 31, 1970, which is a continuation-in-part of application Ser. No. 481,759, Aug. 23, 1965, now Patent No. 3,476,562, dated Nov. 4, 1969, which is a continuation-in-part of application Ser. No. 352,625, Mar. 17, 1964, now abandoned, which is a continuation-in-part of application Ser. No. 278,050, May 6, 1963, now abandoned. This application July 29, 1968, Ser. No. 748,420

Int. Cl. G03c *1/52*

U.S. Cl. 96—90 R 15 Claims

A positive-mode photographic process, and composition therefor, wherein an organic photo-sensitive polymer-former and dye progenitor are dispersed in a non-solubilizing hydrophilic vehicle. Exposure forms a latent image by polymerization in light struck areas. A visible, positive image is obtained by developing the dye progenitor in non-polymerized areas. Multi-layers can be provided with substractive color-dye progenitors to yield a full color direct positive print.

3,650,756

SENSITIZATION OF LAYERS MADE OF POLYMERS WHICH CAN BE CROSS-LINKED BY THE ACTION OF LIGHT

Hans Ohlschlager, Cologne-Stammheim; Oskar Riester, and Eckart Seelig, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 14, 1969, Ser. No. 841,553

Claims priority, application Germany, July 15, 1968, P 17 72 867.5

Int. Cl. G03c *1/52*

U.S. Cl. 96—91 1 Claim

Recording materials comprising at least one layer of a polymer which can be cross-linked by the action of light. The recording material can be very effectively spectroscopically sensitized, particularly in the visible region of the spectrum. The sensitizers include condensation products of a methyl mercapto quaternary salt or of an acetanilidovinyl quaternary salt of a heterocyclic base with a cyanothioacetamide compound in solvent with a base.

3,650,757

PREPARATION OF INORGANIC SALT CRYSTALS

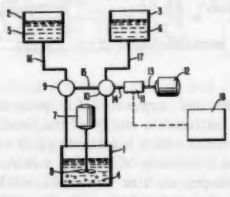
Kazuo Irie, and Keiichi Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed Oct. 23, 1968, Ser. No. 769,983

Claims priority, application Japan, Oct. 23, 1967, 42/68170; Jan. 30, 1968, 43/5556

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 R 11 Claims



An improved method for preparing crystals of a weak-soluble inorganic salt, using a double decomposition of two or more inorganic salts by simultaneously adding aqueous solutions of the inorganic salts to a dispersing medium under conditions of agitation, which comprises increasing the rate of addition of the aqueous solutions of the inorganic salts which are reacted at a rate which is proportional to, or less than, the growth rate of the surface areas of the growing crystals. Particular applicability is found wherein the salt is a silver halide and the dispersing medium is an aqueous gelatin solution.

3,650,758

DIRECT-POSITIVE PRINT-OUT SILVER HALIDE EMULSION FOGGED TO VISIBLE DENSITY

Paul Brewster Gilman, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 20, 1970, Ser. No. 56,703

Int. Cl. G03c *1/36*

U.S. Cl. 96—101 17 Claims

Print-out, direct-positive images are obtained by exposure of a silver bromide emulsion which has been uniformly fogged to a visible density and contains an electron-accepting compound.

3,650,759

SILVER HALIDE EMULSION CONTAINING 1.2-GLYCOL AS SENSITIZER AND ANTIFOGGANT

Minoru Sonoda; Nobuo Yammamoto, and Akikazu Mikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

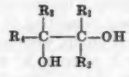
Filed July 9, 1969, Ser. No. 840,477

Claims priority, application Japan, July 9, 1968, 43/48021

Int. Cl. G03c *1/28, 1/34*

U.S. Cl. 96—107 11 Claims

A photographic silver halide light-sensitive emulsion is enhanced in sensitivity without an attendant increase in fog by addition to the silver halide emulsion of a 1,2-glycol of the general formula



wherein R_1, R_2 and R_3 represent a hydrogen atom or an alkyl group, and R_4 represents a hydrogen atom, an alkyl group, an aryl group, an alkoxyalkyl group, an aryloxyalkyl group, or an allyloxyalkyl group.

3,650,760

ALKOXY MERCAPTOPHENOLS AS PHOTOGRAPHIC ADDENDA FOR PHOTOGRAPHIC ELEMENTS

John W. Gates, Jr., and Dorothy J. Beavers, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 17, 1969, Ser. No. 858,857

Int. Cl. G03c *1/34*

U.S. Cl. 96—109 15 Claims

Alkoxy mercaptophenols are used in photographic silver halide elements and emulsions in order to stabilize said elements and emulsions against fog.

3,650,761

PHOTOSENSITIVE RESIST

Rosemonde W. Killy, Seattle, Wash., assignor to Powers Chemco, Inc., Glen Cove, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,374

Int. Cl. G03c *1/68, 5/00*

U.S. Cl. 96—115 R 8 Claims

A new photosensitive resist for the production of photoengravings, photolithographic plates and printed circuits, hav-

ing excellent photographic speed and acid resistance comprises a solution in a volatile organic solvent of an ester of a polyvinyl alcohol and a furoic acid, said polyvinyl alcohol having a molecular weight of about 86,000 and having at least 70% of the -OH groups possible in the molecule esterified, preferably almost 100%. The furoic ester may be sensitized by a cyclic compound containing one or more keto groups.

3,650,762

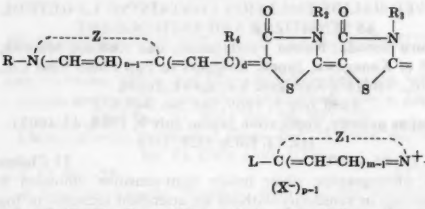
SUPERSENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba; Masanao Hinata; Nobuo Tsuji; Takushi Miyazako, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed July 14, 1970, Ser. No. 54,852
Claims priority, application Japan, July 14, 1969, 44/55970
Int. Cl. G03c *1/28, 1/22*
U.S. Cl. 96—122 **6 Claims**

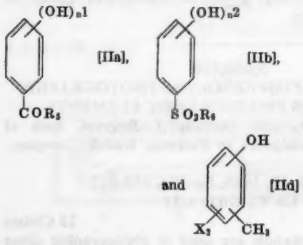
A photographic silver halide emulsion containing

(1) at least one sensitizing dye having the general formula [I]



wherein R, R_1, R_2 and R_3 each is selected from the group consisting of an alkyl, a substituted alkyl, an allyl and an aralkyl group; wherein L is selected from the group consisting of a monomethine group and an aliphatic chain which may combine with the nitrogen atom in the heterocyclic nucleus containing Z_1 to complete a heterocyclic ring; wherein R_4 is selected from the group consisting of a hydrogen atom, an alkyl group, and an aryl group; wherein *m*, *n* and *p* each is 1 or 2, and *d* is 0, 1 or 2; wherein X^- is an anion; wherein Z and Z_1 each represents the non-metallic atoms necessary to complete a heterocyclic nucleus, and

(2) at least one condensate of formaldehyde with a polyhydroxybenzene selected from the group of compounds having the general formula [II*a*], [II*b*], [II*c*]and [II*d*]



[IIa], [IIb], [IIc],

and [IId]

wherein R_5 and R_6 each is selected from the group consisting of $-OH$, $-OM$, $-OR_7$, $-NH_2$, $-NHR_7$, $-N(R_7)_2$, $-NHNH_2$ and $-NHNHR_7$, in which R_7 is selected from the group consisting of an alkyl group containing from one to eight carbon atoms, an aryl group and an aralkyl group; wherein M is selected from the group consisting of an alkali metal atom and an alkaline earth metal atom; wherein X_1 is selected from the group consisting of a hydroxyl group and a halogen atom; wherein X_2 is a halogen atom; and wherein n^1, n^2, n^3 and n^4 each are 1, 2 or 3, wherein n^3 and n^4 are not both 3 is disclosed.

3,650,763

HIGH PRESSURE PROCESS FOR MAKING PUFFED FOOD PRODUCT AND PRODUCT

Ali R. Touba, Crystal, Minn., assignor to General Mills, Inc.

Filed Mar. 26, 1969, Ser. No. 810,777
Int. Cl. A23l *1/18, 1/20*
U.S. Cl. 99—82 **7 Claims**

The process for producing a puffed food product from raw material such as legumes and cereal grains by subject the raw food product to high pressures and temperatures to cement and puff individual grains together to form a wafer-like product having low crumb characteristics and crunchy texture.

3,650,764

ENZYMATIC BAKING COMPOSITIONS AND METHODS FOR USING SAME

Noel Charles Duquette, Flanders, N.J., assignor to H. C. Brill Company, Inc., Fairfield, N.J.

Continuation-in-part of application Ser. No. 732,064, May 27, 1968, now abandoned. This application Mar. 30, 1970, Ser. No. 23,989
Int. Cl. A21d *8/04, 2/04*
U.S. Cl. 99—90 R **14 Claims**

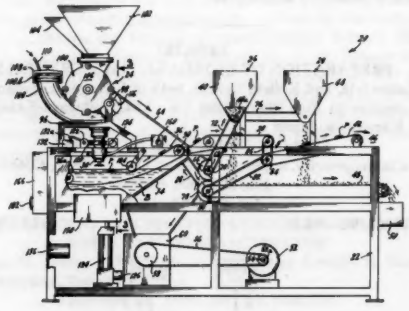
Novel dough-treating compositions containing a proteolytic enzyme such as papain, bromelain or ficin in combination with dough aging agents such as alkali metal and alkaline earth metal iodates, bromates or peroxides and sufficient edible, non-toxic acid so that the pH of a 10 percent aqueous solution is from about 3.7 to 6.5, and the use of such compositions to reduce the fermentation time of yeast-leavened dough.

3,650,765

METHOD AND APPARATUS FOR PREPARING FOOD PRODUCTS

Yechiel Smadar, New York; Howard Roth, Bronx; John P. McCarthy, College Point, and John H. Moyer, Garden City, all of N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

Filed July 7, 1969, Ser. No. 839,173
Int. Cl. A23l *1/00*
U.S. Cl. 99—100 **15 Claims**



A method and apparatus for preparing food products wherein an extrudable slurry of the food product and a gel forming material which is settable upon exposure to a setting solution and is capable of forming a skin, is extruded into an elemental shape, such as a torroid, while washing the surfaces of the elemental shape with the setting solution to form a skin onto the shape. Extrusion is continued to expand the elemental shape into a final extruded food product, with the skin serving to envelope and contain the initial slurry during

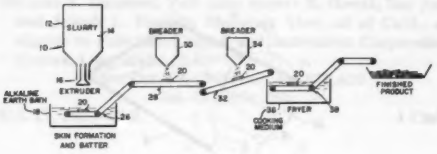
further extrusion and until such time as the product is completed, as by further processing which may include coating and finally stabilizing the slurry as by cooking, baking, frying, freezing or the like.

3,650,766

EXTRUDED FOOD PRODUCTS AND METHOD OF PRODUCING SAME

Yechiel Smadar, New York, N.Y., assignor to DCA Food Industries, Inc., New York, N.Y.

Filed July 7, 1969, Ser. No. 839,191
Int. Cl. A23l *1/00*
U.S. Cl. 99—100 **15 Claims**



Food products may be manufactured in any shape or size by a process including the steps of forming an extrudable slurry of a food material, extruding the slurry and forming a gel-like skin around the extruded product. The skin is formed by subjecting gellable materials such as alginates to the action of gellation agents such as alkaline earth ions, at the surface of the extrusion product. The products may be subjected to further processing including coating, cooking, baking, frying, freezing or the like. In one embodiment the process may be employed to form uniform French fried onion rings.

3,650,767

PREPARATION OF SAUSAGE MEAT EMULSION

Harry C. Stump, Palatine, and Paul L. Ford, Flossmoor, both of Ill., assignors to Armour and Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 807,421, Mar. 14, 1969. This application July 30, 1969, Ser. No. 846,225
Int. Cl. A22c *11/00*
U.S. Cl. 99—109 **4 Claims**

A method for manufacturing sausage meat emulsions in which the broth produced in the high temperature wet rendering of pork fat is combined with frozen raw meat materials to form a sausage meat emulsion.

3,650,768

MAKING AMERICAN CHEESE FROM HEAT TREATED MILK

Miron J. Roberts, Glenview, Ill., assignor to Kraftco Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 668,681, Sept. 18, 1967, now abandoned. This application Feb. 27, 1970, Ser. No. 15,263
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 **13 Claims**

A method for making American cheese and similar types of cheese from heat treated milk so as to provide increased cheese flavor. In accordance with the method, a combination of a particular type of a proteolytic micrococcus and a particular type of lipase are added at specified levels to heat treated milk which is to be made into American cheese. A particular lactobacillus micro-organism may also be used in connection with the combination of the indicated proteolytic micrococcus and specified lipase to provide improved body, flavor and/or texture to the cheese.

3,650,769

VACUUM PUFFED FOODS

Edward L. Fritzberg, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Apr. 29, 1969, Ser. No. 820,309
Int. Cl. A23g *3/00*
U.S. Cl. 99—134 **7 Claims**

To prevent destructive crystallization of vacuum puffed food products, a powdered edible filler is suspended in a matrix which consists of an aqueous solution of a saccharide. The filler can comprise any of a variety of powdered food substances such as flour, dried milk, cocoa, coffee or powdered vegetable solids which remain largely undissolved in the matrix. The dispersion is made up to a stiff taffy consistency, formed into sheets subdivided into pieces of a desired size, heated sufficiently to become soft and exposed to vacuum until expanded to at least two times their original size.

3,650,770

PULPY TEXTURED, STARCH CONTAINING FOOD SYSTEMS

Nicholas G. Marotta, Greenbrook; Harvey Bell, North Plainfield, and Paolo C. Trubiano, Somerville, all of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 540,845, Apr. 7, 1966, now abandoned. This application June 25, 1969, Ser. No. 836,636
Int. Cl. A23l *1/14*
U.S. Cl. 99—139 **6 Claims**

Preparation of starch containing food products exhibiting a grainy, pulpy texture, as well as the food products thus prepared, by admixing the non-starch ingredients of said food product with a cold water swelling, amylose containing starch product which has been pulverized to within a particle size range of no more than about 25 percent retained in a No. 12 mesh U.S. Standard Sieve and no more than about 60 percent by weight passing through a No. 100 mesh U.S. Standard Sieve and thereafter heating the resulting mixture at a temperature of at least about 160° F. so as to effect the swelling of the intact, starch particles therein.

3,650,771

FLAVORING SUBSTANCES AND THEIR PREPARATION

Charles Wiener, Middletown, N.Y., assignor to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed Aug. 1, 1968, Ser. No. 749,271
Claims priority, application Great Britain, Aug. 15, 1967, 37,445/67
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R **8 Claims**

Process for the preparation of flavors of onion and bacon which comprises reacting certain sulfide or hydrosulfide sulfur compounds with certain aldehydes and the products produced thereby.

3,650,772

PUMPKIN PICKLE

Stephanie N. Lapinig, 8976 215th Street, Queens Village, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,423
Int. Cl. A23b *7/00*
U.S. Cl. 99—156 **1 Claim**

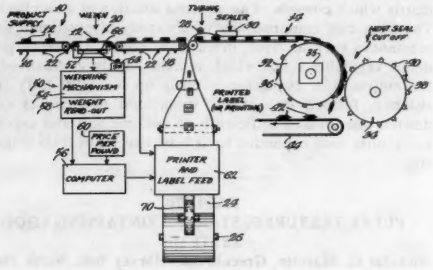
A process for converting pumpkin meat into a desirable flavored sweet-sour pickle, particularly with the use of specific spices. The process includes the chilling of the pumpkin in a brine with ice at 40° to 45° F. for approximately 5 hours or more to achieve crispness, subsequently draining and rinsing, partially cooking, and subsequently combining the partially cooked pumpkin with sugar, distilled white vinegar, water, cinnamon, cloves, allspice, mustard seed, nutmeg and ginger root.

3,650,773

WEIGHING AND LABELING SYSTEM

Robert G. Bush, and Gilbert H. Hannon, both of Green Bay, Wis., assignors to L. D. Schreiber Cheese Co., Inc.

Filed Feb. 9, 1970, Ser. No. 9,578
Int. Cl. B65b *11/12*
U.S. Cl. 99—171 R 9 Claims



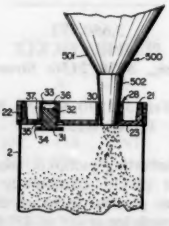
A method and apparatus for automatically weighing and labeling random weight articles as they are being packaged. The articles are moved along a path to a wrapping station by conveying means and a weighing station is located along the path. The weighing station has a weighing mechanism which produces an output that is fed to a computer or other type of device for determining the total price of the article based upon a price per unit of weight. The total price, as well as the price per unit of weight, and the total weight are supplied to a printing mechanism that is disposed adjacent the path of movement of the advancing packages and automatically prints this information on labels that are applied to a continuous supply of film. The printing could also include product identification information, if desired. Furthermore, the printing could be done directly on the film. The feeding of the film and the articles is synchronized so that the portion of the continuous film having the printed information thereon moves into package forming relationship with the article corresponding to the information, whereupon, the article is then completely enclosed by the film to produce a finished package.

3,650,774

FLAT END CASING SYSTEM AND METHOD OF USE

Donald Beth, 325 W. Parkwood Ave., Dayton, Ohio; George P. Saliaris, 352 Schrock Rd., Worthington, Ohio, and Ralph A. Welch, 2470 Lane Road, Columbus, Ohio

Filed July 17, 1969, Ser. No. 842,606
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 23 Claims



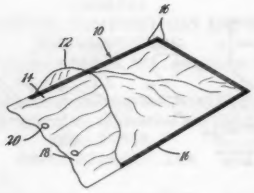
A flat ended casing system having planar plastic end plates mounted on the ends of a hollow food product casing. The end plates are attached to the hollow casing around their periphery. One end plate has a filling valve through which a moldable food product is inserted into the casing and the casing is filled. Upon completion of the filling operation the valve is closed and the filled casing is ready for further processing.

3,650,775

PLASTIC BAG FOR PACKAGING FRESH RED MEAT AND METHOD FOR MAKING THE SAME

Selwyn Simon, Glencoe, and Donatas Tijunelis, Chicago, both of Ill., assignors to Union Carbide Corporation

Filed July 24, 1968, Ser. No. 747,353
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 26 Claims



A film bag for packaging fresh red meats is formed of two dissimilar films one of which has good oxygen transmitting properties but a tendency to "block" to itself, the other of which is non-blocking. Either or both of the films may be shrinkable. The films may be supplied in kit form for the making of bags by the meat packer.

3,650,776

DEHYDRATED POTATO PRODUCT AND PROCESS FOR PRODUCING SAME

Alan W. Tschirgi, P.O. Box 411, Idaho Falls, Idaho

Filed Apr. 16, 1969, Ser. No. 816,807
Int. Cl. A23b *7/03*; A23l *1/12*; A23b *7/16*
U.S. Cl. 99—207 9 Claims

A process for producing an improved dehydrated potato product especially useful for the preparation of "hash-browns." The process includes the steps of preparing, from dehydrated potatoes and water, a liquid system having phases containing starch, pectins, proteins, and fiber; coating cut pieces of fresh or boiled potato with the liquid system; and dehydrating the coated pieces. The resulting product is conveniently rehydrated by merely adding water, and is then fried as a cohesive mass to yield hash-brown potatoes of desirable texture and golden brown color. A milk product, such as sweet dried whey, can be mixed with the liquid system to improve the browning characteristics upon frying. Flavoring agents and various additives can also be included if desired.

3,650,777

ELECTROLESS COPPER PLATING

Frederick W. Schneble, Jr., Oyster Bay; Rudolph J. Zeblisky, Hauppauge; John F. McCormack, Roslyn Heights, and John Duff Williamson, Miller Place, all of N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.

Continuation-in-part of application Ser. No. 9,062, Feb. 5, 1970, now abandoned, which is a continuation-in-part of application Ser. No. 772,061, Oct. 18, 1968, now abandoned, Continuation of application Ser. No. 451,335, Apr. 27, 1965, now abandoned. This application Feb. 11, 1971, Ser. No. 114,695
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 13 Claims

An improved aqueous autocatalytic copper deposition solution is provided which comprises maintaining in a solu-

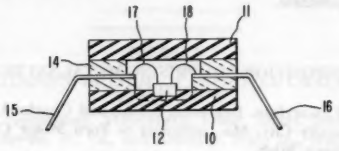
tion, containing complexing and reducing agents for the copper ion and a pH adjuster, a small effective amount of a compound providing a metal value selected from the group consisting of molybdenum, niobium, tungsten, rhenium, rare earths of the actinide series, rare earths of the lanthanide series, and mixtures of the foregoing. Additionally, an improved method of depositing electroless copper is provided which comprises employing the solution hereinabove defined.

3,650,778

LOW-EXPANSION, LOW-MELTING ZINC PHOSPHOVANADATE GLASS COMPOSITIONS

Maurice E. Dumesnil, Palo Alto; Robert R. Hewitt, San Jose, and Joseph L. Bozarth, Mountain View, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Syosset, Long Island, N.Y.

Filed Oct. 29, 1969, Ser. No. 870,620
Int. Cl. C03c *3/00*
U.S. Cl. 106—47 R **1 Claim**



Low-melting, low-expansion, lead-free glass compositions are provided for sealing ceramics parts and encapsulating ceramic substrates. In addition to having a thermal expansion matching that of alumina, the glass compositions provide for the formation of a glass-to-alumina seal in the 380° to 450° C. temperature range.

3,650,779

FLUORIDE GLASSES CONTAINING XENON

Eugene F. Riebling; Paul E. Blaszyk, both of Horseheads, and Dennis W. Smith, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,754
Int. Cl. C03c *3/00*; C09k *1/0*; C04b *35/00*
U.S. Cl. 106—47 R **4 Claims**

This invention relates to the production of low melting fluoride glasses containing oxidized xenon and, more particularly, to the production of fluoroberyllate glasses containing Xe(VI).

3,650,780

FIBER OPTIC CORE GLASS

John H. Connelly, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 1, 1969, Ser. No. 820,780
Int. Cl. C03c *3/00, 13/00*
U.S. Cl. 106—47 Q **3 Claims**

The present invention relates to glass compositions which are eminently suitable for use as core glasses in fiber optic elements. More specifically, the instant invention is concerned with essentially thoria-free glasses in the La_2O_3—B_2O_3-Ta_2O_5—Nb_2O_5 composition field exhibiting an index of refraction (n_D) higher than about 1.80 and a coefficient of thermal expansion (0°–300° C.) of between about 60–70×10^{-7}/°C.

3,650,781

SILICA-CADMIA GLASS BATCHES FOR PRODUCING LOW-TO-MEDIUM EXPANSION GLASSES

Nils Tryggve E. A. Baak, Ridgefield, Conn., assignor to Owens-Illinois, Inc.

Continuation-in-part of application Ser. No. 465,741, June 21, 1965. This application Aug. 28, 1969, Ser. No. 853,960
Int. Cl. C03c *3/04*
U.S. Cl. 106—52 **24 Claims**

Glass batch compositions for producing glasses having linear coefficients of thermal expansion in the range of from about 10 × 10^{-7} to about 20 × 10^{-7} in./in./° C. and which batch compositions are composed of finely divided batch materials consisting essentially of from 70–90 mole percent SiO_2, up 1 to 15 mole percent CdO, and the balance of such Composition, if any, being finely divided batch materials composed essentially of one or more oxides selected from the group consisting of Al_2O_3, TiO_2, B_2O_3, CuO, MnO, ZnO, ZrO_2, Sb_2O_3, AlF_3 and P_2O_5.

3,650,782

BOROSILICATE GLASS FOR PRODUCING ARTICLES BY CENTRIFUGAL CASTING

Wilhelm Baum, Mainz-Mombach, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 16, 1969, Ser. No. 858,267
Claims priority, application Germany, Sept. 17, 1968, P 17 96 183.0
Int. Cl. C03c *3/04*
U.S. Cl. 106—54 **2 Claims**

Glass for producing articles by centrifugal casting composed essentially of 60% SiO_2, 18% B_2O_3, 7% MgO, 6% Li_2O, 4% Al_2O_3, 3% BaO, 1% CaO and 1% K_2O, within tolerances of about ±2 percent, all of the percentages being by weight; and article formed by helium-tight, stress-free fusion of the glass with an Fe—Ni—Co alloy.

3,650,783

TRIVALENT METAL PHOSPHATE COATED COLLOIDAL SILICA MOLDING POWDERS

Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 13, 1969, Ser. No. 824,266
Int. Cl. C04b *35/14*
U.S. Cl. 106—69 **16 Claims**

Compositions having small particle sizes and containing (1) silica and (2) a trivalent metal phosphate and wherein the trivalent metal phosphate is distributed uniformly and homogeneously with respect to the silica, are useful as high temperature refractory binders, coatings, and adhesives and can be pressed to molded articles.

3,650,784

AGGREGATE CONTAINING A TREATMENT AGENT FOR IMPROVING CONCRETE PROPERTIES

Robert J. Albert, Salem, N.H., and John H. Hoge, Cincinnati, Ohio, assignors to said Albert, by said Hoge

Filed Aug. 11, 1970, Ser. No. 63,022
Int. Cl. C04b *31/40*
U.S. Cl. 106—90 **31 Claims**

The internal capillary and pore spaces of porous lightweight aggregate are filled with a solution or suspension of a treating agent capable of improving at least one physical property of concrete. When this treated aggregate is used in the conventional manner in mixing and placing concrete, a treating agent remains absorbed within the aggregate and does not emerge to react or deposit in the concrete matrix until the moist curing, normally given to concrete, is terminated and the cast begins to dry. The treating agent is thus uniformly released throughout the interior of the cast at any time that is selected as optimum in the cement crystallization

cycle for the particular property improvement sought in contrast to the relatively shallow penetration achieved by externally wetting the cast with such agents as in present art. A variety of organic and inorganic agents, many not heretofore usable by the conventional methods, can be incorporated in concrete to improve physical properties such as compressive, tensile and flexural strength, impermeability, freeze/thaw resistance and the like. Agents that would be rendered ineffective if introduced during mixing or in the early stages of hydration can now be utilized by this novel process.

3,650,785

PORTLAND CEMENT COMPOSITIONS REINFORCED WITH NON-ROUND FILAMENTS

Claire G. Ball, Turtle Creek; Arthur C. Grimm, Bellevue Borough, and Thomas Melville, Unity Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation

Continuation-in-part of application Ser. No. 663,315, Aug. 25, 1967, now abandoned. This application Apr. 16, 1970, Ser. No. 29,211

Int. Cl. C04f *31/04*

U.S. Cl. 106—90 **9 Claims**

A reinforced composite of a castable matrix having discontinuous reinforcing filaments randomly distributed within the matrix which reinforce the matrix and which are bonded to the matrix chemically and/or mechanically. The filaments have a non-round cross sectional configuration with width and thickness dimensions and with a width-to-thickness ratio of not greater than about five. For maximum reinforcing strength, the filaments should have an ultimate tensile strength at least equal to the average tensile stress developed in the filament at bond failure. The characteristics of the filaments are such as to permit dry admixing with the castable matrix material. A method of making the reinforced composite and apparatus for and a method of coating the filaments are disclosed.

3,650,786

OIL WELL CEMENT AND METHOD OF MAKING THE SAME

Sam Maravilla, Lansing, Ill., assignor to United States Steel Corporation

Filed June 18, 1969, Ser. No. 834,538

Int. Cl. C04b *7/02*

U.S. Cl. 106—98 **11 Claims**

A cement composition for deep oil wells comprising sintered dicalcium silicate, uncombined calcium oxide, and silica. A method of making the cement in which a mixture of limestone and sand is sintered. For best efficiency the sintering is at a temperature between 2,500° and 2,560° F., and the raw mixture is proportioned to yield a sinter whose primary constituent has a molecular ratio of approximately 2 CaO to 1 SiO_2. If the uncombined CaO in the sinter is below 2 percent, additional CaO is added. Silica is also added to the sinter.

3,650,787

AMPHOTERIC, HIGH AMYLOSE STARCHES AND PREPARATION AND USES THEREOF

Lee H. Elizer, Keokuk, Iowa, assignor to The Hubinger Company, Keokuk, Iowa

Continuation of application Ser. No. 691,179, Dec. 18, 1967 now abandoned. This application Oct. 9, 1969, Ser. No. 866,125

Int. Cl. C08b *25/02*

U.S. Cl. 106—213 **28 Claims**

Amphoteric, high amylose starch containing both basic and acidic groups, preferably tertiary amino and sulfonic acid or sulfonate groups, in the starch molecule, which amphoteric starches are especially useful for sizing threads or yarns of mixed fibers, such as cotton fibers and polyester fibers, viz, polyethylene terephthalate fibers.

3,650,788

REACTIVE COAL TAR SYSTEM CONTAINING PHENOL REACTIVE COMPOUND

Woodrow E. Kamp, Pittsburgh, and Lawrence F. Flaherty, Verona, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Original application Feb. 23, 1967, Ser. No. 610,895, now Patent No. 3,514,316. Divided and this application Aug. 1, 1969, Ser. No. 862,117

Int. Cl. C09d *5/08*

U.S. Cl. 106—287 **3 Claims**

A reactive primer containing phenol-blocked isocyanate molecules and a compound capable of reacting with a phenol is applied to a metal substrate at ambient temperature. Subsequent application of a coal tar enamel at a temperature above 300° F. causes the isocyanate groups to unblock releasing the phenol which then reacts with the phenol reactive compound. The unblocked isocyanate bonds the enamel to the substrate.

3,650,789

COMPOSITION COMPRISING METAL SALTS AND OCHRA

John W. Garrison, Dearborn, Mich., and Charles L. Schlef, University City, Mo., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 29, 1969, Ser. No. 829,144

Int. Cl. G08h *17/24*

U.S. Cl. 106—287 **2 Claims**

This invention relates to a glass coating composition containing silver nitrate, cuprous chloride, potassium chloride barium carbonate and ochre.

3,650,790

NACREOUS MICA PIGMENT COMPOSITIONS

Edward F. Klenke, Liberty Corner, N.J., and George L. Lewis, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 13, 1970, Ser. No. 11,353

Int. Cl. C08h *17/04*; **C09c** *1/28*

U.S. Cl. 106—291 **6 Claims**

Nacreous pigments exhibiting intense interference colors, reduced milkiness and substantial luster are prepared by depositing a thin layer of titanium dioxide on mica flakes, treating the resulting titanium dioxide-coated mica pigment with a soluble silicate in an aqueous slurry at a pH from 7 to 11.5, and calcining the resulting silicate-treated pigment; and the resulting pigment.

3,650,791

PAVING OR BINDER COMPOSITIONS CONTAINING ASPHALT REACTED WITH DIISOCYANATE

Eugene M. Fauber, Hammond, Ind., assignor to Sinclair Research, Inc., New York, N.Y.

Filed Apr. 13, 1967, Ser. No. 630,512

Int. Cl. C08h *13/00, 17/22*; **C08j** *1/46*

U.S. Cl. 106—279 **6 Claims**

Compositions suitable for use as paving or as a binder for paving materials and possessing improved ductility, viscosity and resistance to oxidation are obtained by reacting a minor amount of a diisocyanate with asphalt. The preferred diisocyanate is toluene diisocyanate. This composition may be blended with urethane in situ or the urethane-forming components, e.g., polyhydroxy-terminated polydiene and hydrocarbon diisocyanate may be added separately. Blending the asphalt-diisocyanate composition with urethane-forming

materials has been found to improve viscosity and homogeneity and decrease the amount of carbon tetrachloride insolubles.

3,650,792

METHOD FOR PRODUCING PIGMENTS OF IMPROVED DISPERSIBILITY

Albert Dietz, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 849,894, Aug. 13, 1969, now Patent No. 3,549,396, which is a continuation-in-part of application Ser. No. 506,608, Nov. 5, 1965, now abandoned. This application Aug. 7, 1970, Ser. No. 62,161

Int. Cl. C09c *1/00, 1/36, 3/00*

U.S. Cl. 106—300 **9 Claims**

Pigmentary metal oxides, e.g., titanium dioxide, are treated with an organic amine, e.g., triethanolamine, and an organic nitrogen compound containing an ionizable hydrogen atom attached to the nitrogen atom, the nitrogen atom being flanked by at least one carbonyl group, e.g., ortho-benzosulfimide.

3,650,793

TITANIUM DIOXIDE OF IMPROVED CHALK RESISTANCE

Neil C. Goodspeed, Wadsworth, Ohio; Albert Dietz, New Martinsville, W. Va., and Russel R. May, Jr., Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 28, 1969, Ser. No. 803,447

Int. Cl. C09c *1/36*

U.S. Cl. 106—300 **17 Claims**

Pigmentary titanium dioxide having a metal oxide coating, e.g., zinc oxide, is heat treated and then given a separate hydrous metal oxide coating, e.g., an alumina and silica coating. The resulting pigment has good chalk resistance and good retention of optical properties such as gloss, color and tint efficiency.

3,650,794

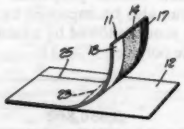
CORRECTION ACCESSORY FOR HECTOGRAPHIC STENCILS

Richard L. Steinbach, 525 Windsor Place, Laguna Beach, Calif.

Filed June 19, 1970, Ser. No. 47,843

Int. Cl. B32b *35/00;* **B41m** *5/00*

U.S. Cl. 117—2 TC **12 Claims**



An accessory for use in correcting errors made in typing hectographic masters comprising a continuous tape having side-by-side bands of hectographic and adhesive materials along the midsection and one lateral edge thereof, leaving the other edge of the tape uncoated and usable as a finger tab. A severed length of the tape can be affixed temporarily to the back of the master sheet with the hectographic band positioned properly for use in correcting an erased error and the finger tab being thereafter usable to remove the length of tape.

3,650,795

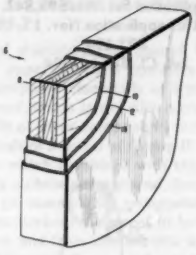
CONCRETE FORM SURFACING

John H. Willingham, 1280 Estate Drive, Memphis, Tenn.

Filed Jan. 27, 1969, Ser. No. 794,227

Int. Cl. B29c *1/04*

U.S. Cl. 117—5.1 **7 Claims**



There is disclosed herein a method for preparation and construction of concrete pouring forms in which the surfaces and edges of the form members are treated with several coats of a resinous material exhibiting particularly advantageous mechanical and chemical properties. A preferred material is a moisture cured urethane prepolymer solution.

3,650,796

PHOTOLITHOGRAPHIC MASKS

Thomas Meirion Jackson, Stortford; Eric Langley Bush, Waltham Cross; Thomas John Rowe, Stortford, and David John Moule, Saffron Walden, Essex, all of England, assignors to Standard Telephones and Cables Limited, London, England

Filed May 27, 1969, Ser. No. 828,367

Claims priority, application Great Britain, June 6, 1968, 26,940/68

Int. Cl. B44c *1/22;* **B44d** *1/50*

U.S. Cl. 117—8 **2 Claims**

A method of making a photolithographic mask comprising the steps of depositing upon a transparent substrate a thin film of a polymeric material which is capable of being pyrolized to form thin film on the substrate, heating the film in order that the film is pyrolized, and removing selected areas of the pyrolized film in an oxidizing atmosphere by means of a laser beam to form the desired mask pattern.

3,650,797

DEVELOPING ELECTROSTATIC LATENT IMAGES WITH A MIXTURE OF POSITIVE AND NEGATIVE TONERS

Martha Tomanek, nee Kunitzer Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrick, Germany

Continuation of application Ser. No. 598,152, Dec. 1, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 123,099, July 11, 1961, now abandoned. This application May 18, 1970, Ser. No. 37,472

Int. Cl. G03g *13/08, 13/22*

U.S. Cl. 117—17.5 **13 Claims**

This invention relates to a developer and process for developing an electrostatic latent image, which process comprises applying to the image, in the absence of a carrier, a mixture consisting of effective amounts of at least one fusible, organic toner capable of acquiring a positive charge, and at least one infusible, inorganic toner of approximately the same effective particle size capable of acquiring a negative charge. The developed image is fused by heating and then treated with an alkaline liquid which removes the inorganic toner particles and renders hydrophilic the image free areas.

3,650,798

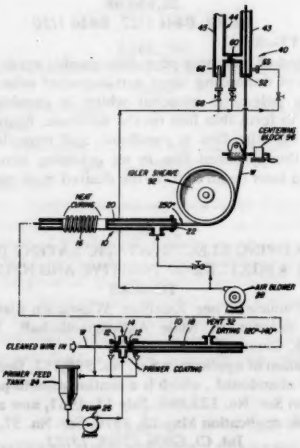
METHOD FOR CONTINUOUS COATING OF METALLIC PRODUCTS WITH FUSIBLE PULVERULENT MATERIALS

John S. Case, Baltimore, Md., and William B. Johnson, Marion, Mass., assignors to Anchor Post Products, Inc., Baltimore, Md.

Continuation of application Ser. No. 598,842, Dec. 2, 1966, now abandoned. This application Nov. 17, 1969, Ser. No. 877,494

Int. Cl. B44d *1/094*

U.S. Cl. 117—21 9 Claims



A method is described for the coating of running strands or webs with a thermoplastic protective layer. The successive steps comprise the application of a primer and the hot air current drying and curing of same supplemented by inductive heating. The temperature is next raised in two successive stages by inductive type heaters, the later stage while the strand or web is vertically traversing the length of a continuously replenished dense cylindrical bed of powdered vinyl polymer or the like. The replenishment as well as cooling of the powder is accomplished through a recirculatory arrangement powered by air nozzles. Alternate coating materials are proposed including polyolefins containing compounds of metal.

3,650,799

SUBSTRATES PROTECTED WITH PREPARED POLYMERIC ULTRAVIOLET LIGHT STABILIZERS FROM PHENOL-FORMALDEHYDE CONDENSATES

Raymond H. Young, Jr., East Longmeadow; Albert H. Markhart, Wilbraham, and Joseph G. Martins, Ludlow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 606,595, Jan. 3, 1967, abandoned.

Filed Aug. 11, 1969, Ser. No. 849,210

Int. Cl. B44d *5/06*

U.S. Cl. 117—33.3 6 Claims

This invention relates to polymeric ultraviolet light stabilizers which are the esterification products of (A) phenol-formaldehyde condensates, which have at least 12.5 mol percent of the positions ortho to the esterifiable hydroxyl group unsubstituted, and (B) a compound capable of esterification with the phenol formaldehyde condensate which contains at least one ring of six carbon atoms characterized by having benzenoid unsaturation. Upon exposure to ultraviolet light, the exposed portion of the ester rearranges to form a polymeric compound which is a barrier to ultraviolet light.

3,650,800

TEXTILE PRODUCTS AND PRODUCTION THEREOF

Martin Reiner, Plochingen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1969, Ser. No. 809,932

Claims priority, application Germany, Apr. 25, 1968, P 17 60 260.7

Int. Cl. B44d *1/44*

U.S. Cl. 117—37 2 Claims

Coated textiles are produced by a process in which 4-rail knitted fabric which is napped on one face is coated on the napped face with a polyurethane and subsequently grained mechanically.

3,650,801

SOIL RELEASE FOR 100% SYNTHETIC FIBERS

Everett H. Hinton, Jr., and Larry E. Avery, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed July 25, 1968, Ser. No. 747,473

Int. Cl. D06m *15/36*

U.S. Cl. 117—47 A 13 Claims

Soil release properties of a 100 percent synthetic textile are improved by impregnating the same with a mixture of polyacrylic acid and an essentially linear water-insoluble swellable synthetic polymer which absorbs at least 550 percent of water. Soil release properties of a 100 percent synthetic textile can also be improved by subjecting the textile to an alkaline scour followed by treatment with the water insoluble swellable polymer.

3,650,802

PROCESS FOR COATING A SUBSTRATE WITH A POLYENE/POLYTHIOL COMPOSITION

Clifton Leroy Kehr, Silver Springs, and James Leverette Guthrie, Ashton, both of Md., assignors to W. R. Grace & Co.

Continuation-in-part of application Ser. No. 793,534, Jan. 23, 1969. This application Mar. 7, 1969, Ser. No. 805,354

Int. Cl. B44d *1/092*, *1/36*

U.S. Cl. 117—47 R 41 Claims

This invention relates to curing of coatings, sealants and laminates under ambient conditions without affecting the pot life of a curable liquid composition comprising a polyene containing at least two reactive unsaturated carbon to carbon bonds per molecule and a polythiol containing at least two thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon to carbon bonds per

molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than four which comprises having present at least a minor amount of an iron-containing material either as a portion of the substrate, as a primer coat for the substrate or as a top coat for the curable composition. In the case where oxygen is excluded from the reaction, a minor amount of an oxime ester is added to the system to assure curing to a solidified product.

3,650,803

METAL PLATING OF SUBSTRATES

Kingso Chingtsung Lin, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 750,477, Aug. 6, 1968, now abandoned. This application July 3, 1969, Ser. No. 839,080

Int. Cl. B44d *1/092*; C23c *3/02*

U.S. Cl. 117—47 A 50 Claims

Substrates are plated with metals by subjecting the substrate to low oxidation state phosphorus compounds, usually in a solvent, followed by subjecting the treated substrate to a metal salt or complex thereof. The low oxidation state phosphorus compounds, wherein the phosphorus has an oxidation state of less than 5, i.e., an oxidation number of −3 to +3, can be prepared by reacting elemental phosphorus, preferably elemental white phosphorus (which include various impure or commercial grades sometimes referred to as yellow phosphorus), with a nucleophilic reagent or organometallic compound. The resulting treated substrate is electroless metal plated and/or electroplated to provide an adherently bound metal layer on the substrate. In one embodiment, the substrate is subjected to a low oxidation state phosphorus compound and thereafter electroless metal plated.

3,650,804

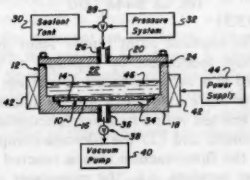
PROCESS FOR DECREASING PERMEABILITY OF A POROUS BODY AND THE PRODUCT THEREOF

Anthony Parisi, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 19, 1969, Ser. No. 800,667

Int. Cl. B44d *1/34*

U.S. Cl. 117—49 8 Claims



A process for decreasing the permeability of a porous body and the resulting product wherein a preferably highly fluid synthetic resin sealant is impressed under pressure into pores on one surface of a normally porous body until resin has bled through the body to a desired depth or to an opposite surface completely filling the pores of the body and then curing the synthetic resin sealant in said pores. Such a body may be made impervious to gas pressures exceeding the tensile limit of the body.

3,650,805

METHOD OF MANUFACTURING COATED PAPER

Saburo Imoto, 1652 Sakazu; Kyoichiro Ikari, 550 Yasue; Hirosaburo Mori, and Tatsuaki Hattori, both of 1621 Sakazu, all of Kurashiki-shi, Japan

Filed June 28, 1968, Ser. No. 741,206

Claims priority, application Japan, June 30, 1967, 42/42708

Int. Cl. B44d *1/44*; B32b *7/10*

U.S. Cl. 117—62.2 5 Claims

A method of manufacturing coated VIII of which comprises treating paper which is coated with a coating color composition composed essentially of a pigment, a PVA or a derivative thereof, and a latex, with a treating solution composed essentially of three components including from about 1 to 9 parts of a salt of a metal of Group II, III, IV or VIIIof the Periodic Table which combines with the PVA or derivative thereof, to form a chelate compound, from about 1 to 9 parts of boric acid [a nonmetallic compound] which combines with the PVA or derivative thereof to have a joint tackifying or gelling action, and from about 0.001 to 1 part of a surface active agent. The coated paper obtained by the method of the invention has superior water resistance and offset printability qualities and in addition possesses extremely improved luster on the finished surface.

3,650,806

PROCESS FOR TREATING WOOL

George M. Wagner, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 622,465, Mar. 13, 1967, now abandoned. This application Feb. 16, 1970, Ser. No. 11,900

Int. Cl. B44d *1/44*; D06m *15/52*

U.S. Cl. 117—62.2 15 Claims

A process for treating wool and other proteinaceous material to render it shrinkproof which comprises treating the proteinaceous material with a polymerizable treating solution which contains the reaction product of a diol and a polyisocyanate or a urethane-polyisocyanate, and, thereafter, curing the thus-treated material with water. The reaction product produced contains at least three free NCO groups per molecule. Preferably, the polyisocyanate or urethane-polyisocyanate used contains three isocyanate groups. These isocyanates may be of the polymethylene polyphenyl type, as well as of the type formed by reacting a polyhydroxy compound containing from three to six OH groups with a diisocyanate and, additionally, may also contain from about 0.05 to 3 percent by weight of tertiary nitrogen. The solutions used to treat the proteinaceous material typically contain from about 0.5 to 50 percent by weight of the above compositions. The proteinaceous materials treated with these compositions are found to have an improved hand over those materials which are treated with similar solutions but which contain polyisocyanates or urethane polyisocyanates which have not been reacted with a diol.

3,650,807

SUBSTRATE HAVING METAL PHOSPHORUS OR METAL PHOSPHORUS SULFUR COMPOUND ON SURFACE AND CURED SICCATINE COATING COMPOSITION THEREON

Gilbert Witschard, Grand Island, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 722,543, Apr. 19, 1968, now abandoned. This application Sept. 30, 1970, Ser. No. 76,999

Int. Cl. B32b *27/06*; B44d *1/14*

U.S. Cl. 117—69 15 Claims

A siccative coating composition such as paint, lacquer, varnish, enamel and the like, is applied to an article having a metal phosphorus and/or metal phosphorus sulfur compound

adherently formed at the surface of a substrate, wherein said metal is selected from groups 1B, 11B, IVB, VB, VIB, VIIB and VIII of the Periodic Table.

3,650,808

POLYCARBONATE SURFACES HAVING TENACIOUSLY ADHERED ORGANOPOLYSILOXANE COATINGS THEREON AND PROCESS FOR MAKING

Donald W. Gagnon, 6802 Gaines Mill Drive, Sylvania, Ohio

Filed Apr. 8, 1970, Ser. No. 26,803
Int. Cl. B44d *1/092;* **B32b** *27/08*
U.S. Cl. 117—72 **14 Claims**

Process, and the article produced thereby, for providing a tenaciously adhered, hard, acetone-resistant and mar-resistant coating on articles having a polycarbonate surface. The process includes priming the polycarbonate surface with preferably gamma-aminopropyltriethoxysilane, then coating the primed surface with a solution of a solvent-soluble, further-curable organopolysiloxane in an organic solvent and thereafter evaporating the solvent and finally curing the organopolysiloxane. The solvent-soluble, further-curable organopolysiloxane is produced by heating methyltrialkoxysilane or a mixture of methyltrialkoxysilane and phenyltrialkoxysilane and water in the presence of a hydrolysis catalyst at a sufficient temperature and for a suitable time to form a partial condensation product, concentrating this product by heating to remove some alkanol by-product and water and thereafter precuring the product by heating below the gel point thereof.

3,650,809

POLYETHYLENE COATED METAL SUBSTRATE AND PROCESS OF PREPARING SAME

Kenneth D. Gilliam, Cedar Lake, Ind., and Alfred W. Kehe, Berkeley, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 15, 1969, Ser. No. 858,164
Int. Cl. B44d *1/14;* **B32b** *15/08*
U.S. Cl. 117—75 **9 Claims**

A method for bonding polyethylene to an enamel coated metal surface wherein there is employed as a bond promoting interlayer between the polyethylene and enamel coated metal surface a resinous mixture of a carboxyl containing polyethylene resin and a vinyl butyral polymer. The polyethylene coated metal surface is suitable for the manufacture of metal containers.

3,650,810

GLASS FIBERS IMPREGNATED WITH POLYMERS CONTAINING AN UNSATURATED SILANE

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation

Filed Nov. 20, 1969, Ser. No. 878,500
Int. Cl. C03c *17/30, 17/32*
U.S. Cl. 117—76 **10 Claims**

The improvement in the bonding relationship between glass fibers and elastomeric materials in the manufacture of glass fibers, glass reinforced elastomeric products wherein the individual glass fibers are sized, or a bundle of fibers are impregnated with a composition containing a polymeric material formed by the reaction of an organic silane having ethylenic unsaturation with either a copolymer of styrene and butadiene or poly-alpha-olefins.

3,650,811

ACRYLIC-SILOXANE RESIN PAINT IV

John D. Nordstrom, Detroit, and Carolyn B. Zelek, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1969, Ser. No. 888,055
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **17 Claims**

A novel acrylic-siloxane paint binder resin that is cross-linkable with vinyl monomers by exposure to an electron beam is produced in a three step reaction wherein (1) a siloxane having two or more hydroxy or alkoxy functional groups per molecule is reacted with a C_5–C_{12} monohydroxy acrylate, i.e., the monohydroxy ester of a C_2–C_8 diol and acrylic or methacrylic acid, (2) the siloxane-acrylate product of the first reaction step is reacted with a mixture of vinyl monomers having as a constituent monomer an acrylate selected from glycidyl acrylate and glycidyl methacrylate, and (3) the resultant siloxane-acrylate-vinyl monomer copolymer is reacted with acrylic or methacrylic acid.

3,650,812

ACRYLIC-SILOXANE RESIN PAINT AND PAINTED ARTICLE

John D. Nordstrom, Detroit, and Carolyn B. Zelek, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1969, Ser. No. 888,056
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **17 Claims**

A novel acrylic-siloxane paint binder resin that is cross-linkable with vinyl monomers by exposure to an electron beam is produced in a three step reaction wherein (1) a siloxane having two or more hydroxy or alkoxy functional groups per molecule is reacted with a C_5 - C_{12} monohydroxy acrylate, i.e., the monohydroxy ester of a C_2 - C_8 diol and acrylic or methacrylic acid, (2) the siloxane-acrylate product of the first reaction step is reacted with a mixture of vinyl monomers at least one constituent monomer of which is selected from glycidyl acrylate and glycidyl methacrylate, and (3) the resultant siloxane-acrylate-vinyl monomer copolymer is reacted with a C_5 - C_{12} monohydroxy acrylate, i.e., the monohydroxy ester of a C_2 - C_8 diol and acrylic or methacrylic acid.

3,650,813

ACRYLIC-SILOXANE RESIN PAINT II

John D. Nordstrom, Detroit, and Carolyn B. Zelek, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1969, Ser. No. 888,058
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **18 Claims**

A novel acrylic-siloxane paint binder resin that is cross-linkable with vinyl monomers by exposure to an electron beam is produced in a two step reaction wherein (1) a siloxane having two or more hydroxy or alkoxy functional groups per molecule is reacted with a hydroxy functional copolymer of acrylic monomers, and (2) the siloxane-comprising reaction product of the first reaction step is reacted with a C_5 - C_{12} monohydroxy acrylate, e.g., the monoester of a C_2 - C_8 diol and acrylic or methacrylic acid.

3,650,814

PROCESS FOR PREPARING MOLDABLE THERMOPLASTIC POLYMER PARTICLES

John A. Elder, Jr., Plainfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 9, 1969, Ser. No. 865,188
Int. Cl. B44d *5/00*
U.S. Cl. 117—100 C **6 Claims**

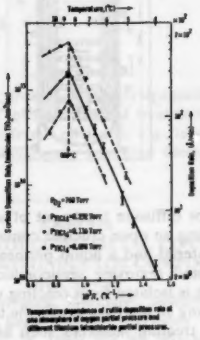
Thermoplastic polymers can be treated directly with an organo-functional silane coupling agent and a resinous

copolymer of ethylene and acrylic and/or methacrylic acid so as to enhance their bonding to inorganic oxide substrates thereby providing moldable products with superior physical properties heretofore unattainable.

3,650,815
CHEMICAL VAPOR DEPOSITION OF DIELECTRIC THIN FILMS OF RUTILE

Rathindra N. Ghoshtagore, Monroeville, and Robert F. Yut, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1969, Ser. No. 863,973
Int. Cl. C23c *11/00, 13/00*
U.S. Cl. 117—106 **17 Claims**



Thin films of titanium dioxide in the rutile form are deposited by chemical vapor deposition technique on a heated surface of a substrate by reacting titanium tetrachloride with oxygen, in the range of temperatures from 700° to 900° C.

3,650,816
ADDITIVES FOR CLOTHES DRYERS

Jerome Rudy, Livingston, N.J., and Anthony A. Rapisarda, Elmhurst, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed July 17, 1969, Ser. No. 842,719
Int. Cl. B05c *3/08;* **C11d** *3/48;* **D06m** *13/00*
U.S. Cl. 117—109 **9 Claims**

A novel method for applying adjuvants to fabric employing a tumbler-type dryer is disclosed. To achieve uniform distribution of the adjuvant on the fabric, the adjuvant, in accordance with the present invention, is sprayed on to the dryer drum. Spreading agents, distributing agents or carrier may be included in the composition sprayed on to the dryer drum if desired. Novel compositions of matter suitable for use in the practice of this invention are also disclosed.

3,650,817
METHOD OF MANUFACTURING LOW THERMAL-EXPANSION PORCELAIN

Inoue Motoyuki, Nagoya-shi, Japan, assignor to Nippon Toki Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan

Continuation-in-part of application Ser. No. 499,022, Oct. 20, 1965, now Patent No. 3,499,787, dated Mar. 10, 1970. This application Aug. 8, 1969, Ser. No. 848,693
Int. Cl. C03c *17/00*
U.S. Cl. 117—118 **6 Claims**

A heat resistant porcelain body having a smooth, dense and hard glaze layer on the surface thereof is prepared by coating a porcelain body comprised of at least one of petalite and spodumene in admixture with plastic clay and containing specified amounts of Al_2O_3, SiO_2 and LiO_2 in addition to at least one of 0.5–6 percent by weight of ZnO and 7–26 percent by weight of free SiO_2 with a glaze preparation containing primarily SiO_2 and thereafter firing the coated porcelain body at 1250°–1350° C.

3,650,818
GLASS FIBERS COATED WITH VINYL POLYMERS CONTAINING AN AMINE

Alfred Marzocchi, Cumberland, R.I., and Richard C. Horton, Millwood, N.Y., assignors to Owens-Corning Fiberglas Corporation

Continuation-in-part of application Ser. No. 96,106, Mar. 16, 1961, now Patent No. 3,234,042. This application July 8, 1965, Ser. No. 470,618
Int. Cl. C03c *25/00;* **C08g** *41/04*
U.S. Cl. 117—126 GB **4 Claims**

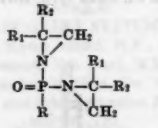
Glass fibers are coated with a formulation containing vinyl polymer. 2-10% by weight of an amine compound is added to the vinyl polymer. A typical formulation contains 100 pts. PVC, 6 pts. undecyl benzyl phthalate, 21 pts. tri-o-phosphate, 21 pts. epoxidized tall oil ester, 4 pts. paste aluminum pigment, 2 pts. Sb_2O_3, a heat stabilizer, a barium-cadmium coupler, an ulta violet stabilizer, and a hydrocarbon thinner. The amines may be vinyl pyrrolidone monomer, propylamine, polyvinyl pyrrolidone acrylamide, aminopolyethylene, polyvinyl pyridine, polyacrylonitrile, hexamethylenediamine, and diphenyl guanidine.

3,650,819
DURABLE FIRE-RETARDANT FINISH FOR CELLULOSIC TEXTILE MATERIALS

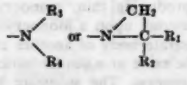
Robert George Weyker, North Plainfield, and George Louis Mina, Highbridge, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 8, 1968, Ser. No. 765,961
Int. Cl. C09k *3/28;* **D06m** *13/26*
U.S. Cl. 117—136 **6 Claims**

A method for providing a hard water wash durable cyanamide-phosphoric acid, flame-retardant finish for cellulosic textile materials which comprises aftertreating the textile material bearing the cyanamide-phosphoric acid finish with an aziridinyl phosphine oxide of the formula:



wherein R is alkyl, aryl, cyclo alkyl,



R_1 and R_2 are hydrogen or lower alkyl; and R_3 and R_4 are alkyl, or, taken together with the nitrogen, represent a heterocyclic ring, followed by a curing step.

3,650,820

PRODUCTION OF FLAME RETARDANT CELLULOSIC MATERIALS

Joseph DiPietro, Alma; John Heaton Todd, St. Louis, and Robert John Mulph, Alma, all of Mich., assignors to Michigan Chemical Corporation, St. Louis, Mich.

Filed Feb. 17, 1969, Ser. No. 800,831
Int. Cl. C09k *3/28*; D06m *13/26*; C09d *5/18*
U.S. Cl. 117—136 11 Claims

Various cellulosic materials such as cotton, burlap, jute, fiberboard and paper may be rendered flame retardant without impairing desirable physical properties by treating them with an aqueous solution of a water soluble salt of a polyhaloalkyl acid ester of phosphoric acid in which the halogen is bromine or chlorine and in which the alkyl radical contains two through six carbon atoms. An acid may be used if it is water soluble.

3,650,821

RAPID CURING MELAMINE-FORMALDEHYDE IMPREGNATED PAPER SHEET FOR PRODUCING SURFACE OF IMPROVED STAIN RESISTANCE AND LUSTER RETENTION

Kenneth D. Meiser, Dallas, Tex., assignor to Plastics Manufacturing Company, Dallas, Tex.

Continuation-in-part of application Ser. No. 745,130, July 16, 1968, now abandoned, and a continuation-in-part of 473,815, July 21, 1965, now abandoned. This application Aug. 10, 1970, Ser. No. 62,648
Int. Cl. D21h *1/40*
U.S. Cl. 117—155 L 2 Claims

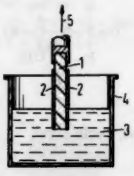
An aqueous solution of a slightly hydrophobic, unmodified reaction product of formaldehyde and melamine in a molar ratio from 1:1 to 1.9:1 and, as a curing catalyst, a water-soluble acidic salt of aluminum or zinc, which solution remains ungelled for at least 12 hours at ordinary temperatures, is used to impregnate a cellulosic paper sheet. The dried sheet forms a surface lamination cures in 1 to 2 minutes at 315° F. to a surface having superior stain-resistance and luster retention.

3,650,822

METHOD OF PRODUCING EPITACTIC SEMICONDUCTOR LAYERS ON FOREIGN SUBSTRATES

Josef Grabmaier, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 25, 1969, Ser. No. 860,942
Claims priority, application Germany, Sept. 30, 1968, P 17 94 273.3
Int. Cl. B44d *1/18*; H01l *7/40*
U.S. Cl. 117—201 9 Claims



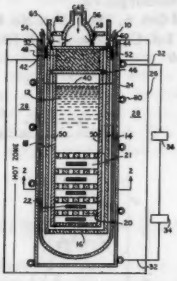
A method of producing thin, monocrystalline layers of semiconductor material, upon a monocrystalline, preferably wafer-shaped, substrate body of another chemical composition, but having the same or a similar lattice structure, by an epitactic growth process. The substrate body is immersed into a melt comprising the appropriate semiconductor material. A temperature balance between the substrate body and the melt, is established. Thereafter the semiconductor material epitactically grown on the surface of the substrate body, by slowly pulling the substrate body out from the melt.

3,650,823

METHOD FOR PROCESSING SEMICONDUCTORS

Carver A. Mead, Pasadena, and James O. McCaldin, South Pasadena, both of Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 24, 1969, Ser. No. 860,736
Int. Cl. C23c *13/04*, *17/00*; H01l *7/46*
U.S. Cl. 117—201 15 Claims



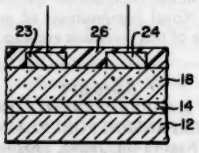
A system for diffusion treatment of semiconductor compounds including an open crucible containing a molten bath of treating material and a liquid permeable carrier member for inserting and removing semiconductor slabs from the bath. The bath is isolated from reacting with the atmosphere by slowly flowing an inert gas across the top of the bath. High melting point treating materials such as zinc can be more readily removed from semiconductors such as zinc sulfide by quickly removing the carrier from the zinc bath and inserting the carrier into a bath of a material having a much lower melting point such as indium or gallium. The lower melting material displaces the higher melting material and the lower melting material is then mechanically removed from the slabs while being heated on a hotplate to a temperature above the melting point of the lower melting material.

3,650,824

ELECTROLUMINESCENT DISPLAY PANEL

Zoltan P. J. Szepesi, and Michael A. Novice, both of Elmira, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1969, Ser. No. 857,751
Int. Cl. H01j *1/70*; B44d *1/18*
U.S. Cl. 117—212 6 Claims

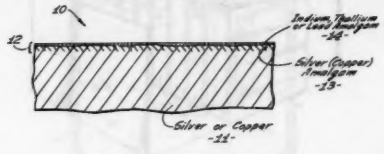


An electroluminescent display device comprised of an electroluminescent layer having a large area front electrode and a plurality of back electrodes in which coatings operatively associated with the back electrodes eliminate dark gaps between the light emitting electrodes.

3,650,825
METHOD FOR MANUFACTURE OF AN ELECTRICAL CONTACT

Franz Lihl, Vienna, Austria, assignor to Schaltbau GmbH, Munich, Germany

Filed June 19, 1969, Ser. No. 834,839
Int. Cl. B44d 1/14, 1/18
U.S. Cl. 117—217 18 Claims

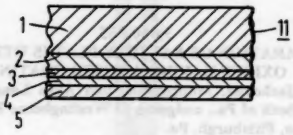


Contact elements are made by amalgamating copper or silver contact pieces through thermal treatment with mercury. Subsequently a different amalgam, e.g., lead, thallium, or preferably, indium amalgam is deposited thereon, rubbed in and thinned.

3,650,826
METHOD FOR PRODUCING METAL CONTACTS FOR MOUNTING SEMICONDUCTOR COMPONENTS IN HOUSINGS

Wolfgang Ganser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Sept. 26, 1969, Ser. No. 861,355
Claims priority, application Germany, Sept. 30, 1968, P 17 89 062.9
Int. Cl. C23b 5/50; C23c 1/08
U.S. Cl. 117—217 8 Claims



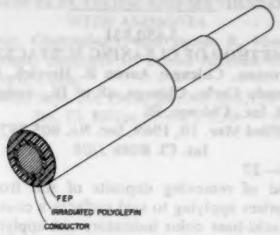
A method for producing metal contact layers for mounting semiconductor components in a housing, particularly those made by the planar technique. The semiconductor component surface to be contacted with the housing is first provided with a layer consisting of aluminum and nickel. Thereafter, a metal layer consisting of titanium is deposited on top of the alloy layer and subsequently thickened by a coating of silver.

3,650,827
FEP CABLES

Chester A. Brown, Andover, and Louis F. Rossetti, Arlington, both of Mass., assignors to Electronized Chemicals Corp., Burlington, Mass.

Filed Nov. 17, 1969, Ser. No. 877,269
Int. Cl. B44d 1/42
U.S. Cl. 117—218 7 Claims

Electric cables of the type known as composite electrical insulated cables are insulated with a first inner layer of insulation material such as polyolefin and second outer layer of an irradiated cross-linked co-polymer of tetrafluoroethylene



and hexafluoropropylene known in the trade as FEP to form a superior high temperature cable.

3,650,828
MAGNETIC COATING FORMULATION FOR RECORDING TAPE

Louis M. Higashi, Monte Sereno, and Herbert R. McEvers, San Jose, both of Calif., assignors to Karex, Inc.

Filed Sept. 4, 1969, Ser. No. 855,405
Int. Cl. H01f 10/02
U.S. Cl. 117—235 4 Claims

A polymeric binder for magnetic coating exhibiting excellent wear and aging characteristics comprised of a mixture of a high molecular weight vinyl chloride-vinyl acetate or a polyvinyl acetal having a glass transition temperature (Tg) in excess of 70° C. and a thermoplastic polyurethane-polyurea, hydroxyl-functional elastomer which is a reaction product of a mixture of a polyesterdiol, a hydrocarbon diol, a diphenyl sulfone diamine and an organic diisocyanate.

3,650,829
METHOD OF PRODUCING GRANULAR DEXTROSE

Raoul Guillaume Philippe Walon, Brussells, Belgium, assignor to CPC International Inc. and Les Industries du Mais

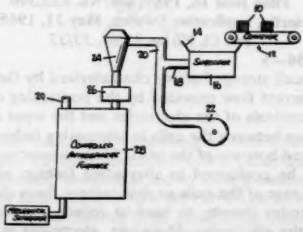
Filed Aug. 6, 1969, Ser. No. 848,100
Int. Cl. C13k 1/06, 1/10
U.S. Cl. 127—60 9 Claims

A process for producing a granular dextrose product having a high content of beta dextrose by seeding a starch hydrolyzate solution containing at least about 90% by weight dry substance, and having a dextrose equivalent of at least 90, to obtain a crystallized mass, breaking the mass up into particles, and recovering a granular dextrose product. Also, the use of the product for lozenges and bakery products.

3,650,830
RECOVERY SYSTEM

Edmund A. Mathis, Staten Island, N.Y., assignor to Nichols Engineering & Research, New York, N.Y.

Original application July 6, 1966, Ser. No. 563,240, now abandoned. Divided and this application June 30, 1969, Ser. No. 851,121
Int. Cl. C22b 21/00; B08b 7/00
U.S. Cl. 134—19 3 Claims



Aluminum is recovered from scrap by volatilization of organics from the scrap in a non-oxidizing furnace having mul-

tiple hearths, and thereafter separating the aluminum from the ash by mechanical means.

3,650,831

METHOD OF CLEANING SURFACES

Eric Jungermann, Chicago; Aaron B. Herrick, La Grange, and Armando Carlo, Chicago, all of Ill., assignors to Armour-Dial, Inc., Chicago, Ill.

Filed Mar. 10, 1969, Ser. No. 805,797
Int. Cl. B08b *3/08*

U.S. Cl. 134—27 **5 Claims**

A method of removing deposits of soil from surfaces, which comprises applying to said surfaces a caustic alkali including an acid-base color indicator, and applying an aqueous solution which is sufficiently acidic to substantially neutralize the caustic and visibly change the color of the caustic. The method has particular efficacy for the cleaning of the interior surfaces of ovens and similar surfaces.

3,650,832

ACTIVE MATERIAL ELECTRODE AND CELL COMPRISING IMPROVED BATTERY GRADE DIVALENT SILVER OXIDE

Aladar Tvarusko, Princeton, N.J., assignor to ESB Incorporated

Continuation-in-part of application Ser. No. 637,643, May 11, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 507,585, Nov. 12, 1965, now abandoned, and a continuation-in-part of 515,497, Dec. 21, 1965, now abandoned. This application Aug. 20, 1969, Ser. No. 851,741
Int. Cl. H01m *35/02*

U.S. Cl. 136—6 **11 Claims**

Battery grade divalent silver oxide (AgO) active material containing an additive selected from mercury, selenium, tellurium and combinations of mercury with lead or tin to provide improved electrical conductivity and/or improved stability in aqueous alkaline electrolyte, without substantially adversely affecting either property. The additive is present in the divalent silver oxide active material in amounts ranging from about 0.1 to about 5 percent by weight of silver, in both ionic and metallic form, in the active material. Instead of being incorporated into the divalent silver oxide active material, the selenium, tellurium, mercury-lead and mercury-tin additives are also effective when incorporated into the alkaline electrolyte of a battery employing divalent silver oxide positive electrodes. The preferred method for incorporating the additives into the divalent silver oxide active material is by chemical coprecipitation during its preparation, though they can also be physically admixed therewith. The divalent silver oxide active material contains at least 50 percent by weight of divalent silver oxide (AgO) with the balance of the active material comprising monovalent silver oxide (Ag_2O) and metallic silver.

3,650,833

MULTICELL STORAGE BATTERY

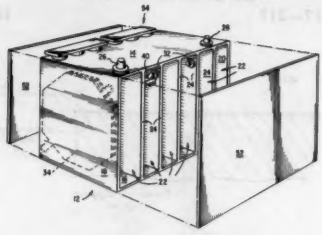
Erik G. Sundberg, Osbacken, Sweden, assignor to Aktiebolaget Tudor, Stockholm, Sweden

Filed June 16, 1969, Ser. No. 833,390
Claims priority, application Sweden, May 21, 1968, 6842/68
Int. Cl. H01m *35/04, 35/32*

U.S. Cl. 136—6 **13 Claims**

A multicell storage battery characterized by the improved path of current flow provided by the positioning of the conductive terminals of the electrodes and the input and output connections between the cells in alternating fashion adjacent the tops and bottoms of the cells. These connections may additionally be positioned in alternating fashion adjacent the front and rear of the cells so that current flows diagonally in the electrodes thereby to tend to reduce resistance in and between the electrodes. Moreover, electrodes may be contoured so that the peripheries of the plates thereof are contained within acute angles having apexes located generally diagonally of one another substantially at the intersection of adjacent plate sides, whereby more effective utilization of the active material in the electrodes is obtained.

A method of making a multicell storage battery wherein an open-sided casing with cell connecting terminals positioned



in alternating fashion adjacent the tops and bottoms of the cells is provided, and then electrode plate sets are inserted laterally into open-sided cells and connected to the cell connectors. Afterwards, the side walls are secured in position. Thus, assembly problems associated with the internal positioning of the cell connecting terminals are obviated.

3,650,834

ALUMINUM BROMIDE FUSED SALT BATTERY

Edward S. Buzzelli, Solon, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 28, 1970, Ser. No. 6,410
Int. Cl. H01m *35/02*

U.S. Cl. 136—22 **8 Claims**

The secondary electrical energy storage battery of this invention comprises a carbon cathode, an aluminum metal anode, and a fused salt electrolyte containing an aluminum halide in admixture with one or more of the halides of the alkali metals. The electrical energy storage device described has the advantage of being operable in a lower temperature range than presently known fused salt batteries.

3,650,835

PREPARATION OF BATTERY PLATES WITH IRON OXIDES HAVING A FUSED COATING

John F. Jackovitz, Monroeville, and Alois Langer, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application Oct. 2, 1968, Ser. No. 764,458. Divided and this application Dec. 16, 1969, Ser. No. 885,404
Int. Cl. H01m *43/04*

U.S. Cl. 136—25 **6 Claims**

A method of producing active electrode material consists of fusing an elemental sulfur, selenium, or tellurium additive coating onto iron oxide and/or hydrated iron oxide, within a temperature range dependent on the melting point of the additive.

3,650,836

ELECTROCHEMICAL CELL WITH AT LEAST ONE GAS DIFFUSION ELECTRODE

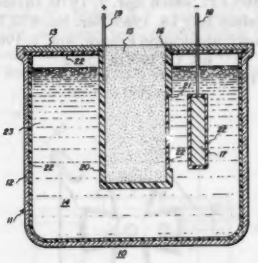
Willard T. Grubb, Schenectady, N.Y., and Robert A. Macur, Milwaukee, Wis., assignors to General Electric Company

Filed Apr. 6, 1970, Ser. No. 25,703
Int. Cl. H01m *27/00*

U.S. Cl. 136—86 R **5 Claims**

An electrochemical cell has at least one positive wetproofed gas diffusion electrode with its major portion within the casing covered with a fuel and oxidant impervious mask, and with its remaining portion within the casing covered with at least one water soluble polymeric thickening agent swellable in the aqueous alkaline electrolyte of a fuel-electrolyte

solution and an alkali metal silicate dissolved in the solution. This cell eliminates or reduces substantially the conventional



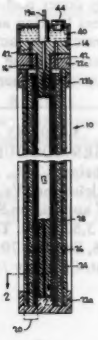
problems of carbonate crust formation, electrolyte leakage, drowning of the gas diffusion electrode, and loss of fuel.

3,650,837

SECONDARY METAL/AIR CELL

Nigel J. Palmer, Port Washington, N.Y., assignor to Leesona Corporation, Warwick, R.I.

Filed Apr. 6, 1970, Ser. No. 25,883
Int. Cl. H01m *29/02*
U.S. Cl. 136—86 A 13 Claims



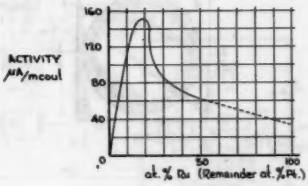
An electrically rechargeable metal/air or metal/oxygen depolarized electrochemical cell and a method of generating electricity therefrom are described. The electrochemical cell comprises an anode capable of being regenerated and a composite cathode having an oxygen-permeable, hydrophobic member layered with catalyst and a bi-porous unit. The coarse pore layer of the bi-porous unit is in contact with the catalyst. A bubble barrier which can be integral with either the anode or composite cathode is in contact with the fine pore layer of the bi-porous unit. During discharge of the cell, the bi-porous unit is flooded with electrolyte and merely acts as a current collector. When charging, oxygen evolution occurs at the fine pore layer and, due to the bubble barrier, the evolved oxygen is forced into the coarse pore layer displacing the electrolyte, thereby protecting the catalyst layer from damage due to oxygen evolution and the high charging potential.

3,650,838

ELECTROCHEMICAL CELL WITH PLATINUM-RUTHENIUM ELECTRODE AND METHOD OF USING WITH AMMONIA

Jose D. Giner, Glastonbury, and James R. Moser, Bolton, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 30, 1965, Ser. No. 491,759
Int. Cl. H01m *27/10, 27/30*
U.S. Cl. 136—86 3 Claims



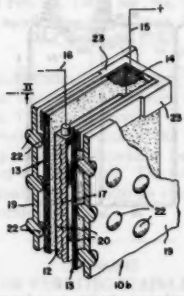
An improved method of, and an apparatus for, generating electrical energy is described comprising feeding ammonia to an anode comprising a major amount of platinum and a second metal of the platinum group in minor but effective amounts. Preferred percentages range from about 75 to 98 parts platinum and from about 25 to about 2 parts of the promoter metal on an atomic weight basis.

3,650,839

FUEL CELL BATTERY

Maurice Lang, Massapequa, N.Y., and Renato Di Pasquale, Paramas, N.J., assignors to Yardney International Corp., New York, N.Y.

Filed July 1, 1968, Ser. No. 741,634
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 1 Claim



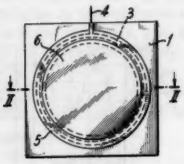
Several fuel cells, each comprising a metal electrode in a gas-permeable envelope electrode with a catalytically effective inner surface, are juxtaposed to form a battery and are separated by solid spacers which are carried on an interposed partition or project directly from confronting outer surfaces of adjoining envelope electrodes to form channels for the admission of air or oxygen to the respective cells.

3,650,840

FUEL CELL WITH ELECTRODE HOLDER

Hermann Dietz, Stuttgart-Giebel, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 12, 1969, Ser. No. 849,457
Claims priority, application Germany, Oct. 12, 1968, P 18 02 803.0
Int. Cl. H01m *27/04, 13/10*
U.S. Cl. 136—86 D 4 Claims



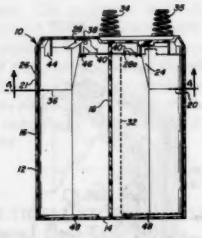
A method of connecting an electrode member to an electrode holder of a fuel cell. An electrically conductive adhesive substance is applied to one or both of the electrode member and the electrode holder, and thereupon the two are placed into contact with one another so as to adhere via the adhesive substance, whereby the electrode is electrically conductively but in fluid-tight relationship connected to the electrode holder.

3,650,841

MULTIPLE CELL GALVANIC BATTERY

Robert Edwin Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 20, 1970, Ser. No. 3,720
Int. Cl. H01m *1/02*
U.S. Cl. 136—132 9 Claims



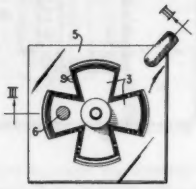
A multiple cell galvanic battery and particularly a container assembly therefor comprising a container with individual compartments for the cells and a cover which fits over the container and seals off the individual compartments. The cells are connected electrically in either series, parallel, or series-parallel relationship by the use of intercell connectors and intercell connecting clips. Battery terminals are sealed to, and extend through, the cover to provide external electrical contact with the battery. The bond between the cover and container supplies sufficient mechanical pressure to maintain good electrical contact between the intercell connectors, cell electrodes and external battery terminals.

3,650,842

ELECTROLYTIC, SECONDARY AND PRIMARY CELLS

Marcel Bougaran, Paris, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France

Original application Jan. 16, 1967, Ser. No. 609,631, now Patent No. 3,505,121, dated Apr. 7, 1970. Divided and this application July 18, 1969, Ser. No. 870,725
Claims priority, application France, Apr. 1, 1966, 56030
Int. Cl. H01m *35/32*
U.S. Cl. 136—134 3 Claims



Electric cell constructions are provided with negative and positive electrodes having edges protruding respectively from opposite ends of an electrode assembly which latter includes a separator or separators between the positive and negative electrodes. Independent plate-like positive and negative electrode current collectors are located at respective opposite ends of the assembly. The respective plate-like members have shapes, e.g., of ray-like configuration and dimensions such as to cover or overlie only portions of such respective protruding edges and leave selected other portions of the respective edges of the electrodes completely uncovered. The plate-like members are welded directly and uniformly respectively to the entirety of those portions of the respective edges that they actually cover and contact. The electrodes comprise metallic carriers bearing active materials except in their edges which are bare of the active materials, and these bare edges of the carriers are those uniformly welded in entirety to the covering portions of the plate-like members.

3,650,843

THERMOCOUPLE

Fred V. Kenyon, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of application Ser. No. 651,570, July 6, 1967, now Patent No. 3,522,107. This application Feb. 15, 1968, Ser. No. 705,767
Int. Cl. H01v *1/02*
U.S. Cl. 136—217 8 Claims

A thermocouple which may be attached to any type of support bracket, has a mounting portion and a pair of adaptors thereon in spaced relation to each other with each adaptor having a resilient element cooperating with the mounting portion to enable initial slip-on positioning of the two adap-

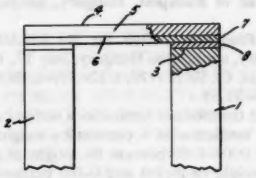
tors which may be finally moved into clamping positions relative to the support bracket.

3,650,844

DIFFUSION BARRIERS FOR SEMICONDUCTIVE THERMOELECTRIC GENERATOR ELEMENTS

Louis F. Kendall, Jr., Scotia, N.Y., and James H. Bredt, Garrett Park, Md., assignors to General Electric Company

Continuation-in-part of Ser. No. 575,244, Aug. 26, 1966
Filed Sept. 19, 1968, Ser. No. 760,989
Int. Cl. H01v 1/04
U.S. Cl. 136—237 **6 Claims**



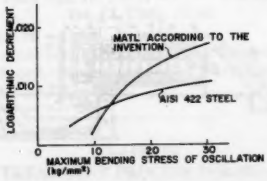
In the manufacture of thermoelectric generators of the lead telluride type, it is desirable that the joints between the thermoelements and the electrodes or bridging members have low electrical resistance and resist fracture during thermal cycling. When materials having a linear coefficient of thermal expansion which is near that of the lead telluride, such as AISI Type 300 stainless steels are used, mechanical failure due to thermal mismatch is eliminated, but unwanted diffusion from the ferrous body into the lead telluride. It has been found that a thin diffusion barrier of iron, molybdenum or tungsten will prevent this degradation.

3,650,845

METHOD OF MANUFACTURE OF STEEL TURBINE BLADES

Teishiro Oda, and Makoto Nakamura, both of Nagasaki-shi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1969, Ser. No. 810,975
Claims priority, application Japan, Mar. 28, 1968, 43/20255
Int. Cl. B22d 25/02; C21d 7/14
U.S. Cl. 148—2 **8 Claims**



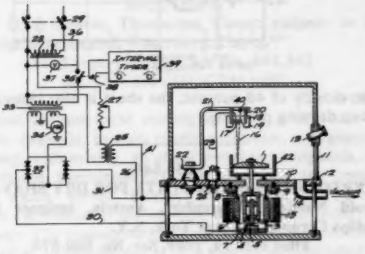
High toughness steel suitable for the manufacture of turbine blades is composed of defined quantities of Cr, Ni, Co, Mo, and iron, wherein the molybdenum may be replaced by tungsten. The steel composition also contains minor amounts of carbon, silicon and manganese. The composition of this steel is selected so that the quantity of δ Ferrite and the Ms point have predetermined values. The steel is subjected to heat treatment, cooling and aging.

3,650,846

PROCESS FOR RECONSTITUTING THE GRAIN STRUCTURE OF METAL SURFACES

William P. Holland, West Redding, Conn., and Robert E. Hueschen, Hales Corners, Wis., assignors to General Electric Company

Filed Nov. 4, 1968, Ser. No. 773,135
Int. Cl. C22f 3/00
U.S. Cl. 148—4 **9 Claims**



Surface brittle fracture of metals is inhibited by impinging on the surface of the metal an intense pulsed beam of charged particles, neutral particles or radiation while the metal is maintained at a temperature at least above its nil ductility temperature. Energy from the pulsed beam creates high thermal gradients and concomitant high stresses which in turn effect high plastic strain in the surface region and produce a unique fine subgrain structure on and immediately underneath the surface. The treatment enhances the resistance of the metal surface to brittle fracture and results in decreased cracking, delaminating and grain lifting.

3,650,847

METHOD OF AUTOMATICALLY CONTROLLING MOTOR SPEED OF GAS-CUTTER

Yoshiaki Arata, Amagasaki, and Katsunori Inoue, Ashiyashi, both of Japan, assignors to Iwatani & Co., Ltd., Osaka, Japan

Filed Feb. 24, 1969, Ser. No. 801,287
Claims priority, application Japan, Apr. 30, 1968, 43/28899
Int. Cl. B23k 7/00
U.S. Cl. 148—9 **6 Claims**

A method of automatically controlling the speed at which a gas flame cutter travels over the work to assure a uniform and complete cut. The flames generate a voltage between the gas nozzle and work which pulsates, the pulsation becoming greater as cutting efficiency decreases due to an excessively fast rate of travel of the nozzle. The pulsations are transformed into a signal to be fed into an electric control system to regulate the nozzle speed.

3,650,848

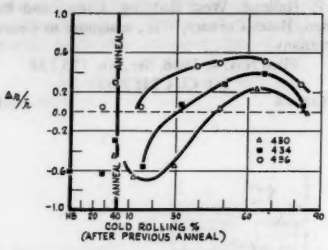
PRODUCTION OF FERRITIC STAINLESS STEEL WITH IMPROVED DRAWING PROPERTIES

Stephen G. Schneider, Garfield Heights; Frank A. Hultgren, North Royalton, and William F. Barclay, Berea, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed June 18, 1969, Ser. No. 834,404
Int. Cl. C21d 7/02
U.S. Cl. 148—12 **15 Claims**

Ferritic stainless steel of the 430 series is produced to have improved drawing properties by procedure in which in a two-stage cold reduction of the hot-rolled band, with an intermediate anneal, the second stage effects reduction of at least about 80 percent, following at least about 30 percent reduc-

tion in the first stage. The finally annealed sheet is substantially non-earing and when the first stage reduction is at least



in the vicinity of 40 percent, the sheet is also characterized by deep drawing property.

3,650,849

PERFORATED SHEAR-PLATE FOR DRY SHAVERS

Leopold Nidetzky, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,576

Int. Cl. C21d *9/00*; B26b *19/04*

U.S. Cl. 148—12.4 **3 Claims**

This invention provides a perforated shear-plate for dry shavers, made of a soft, hardenable steel foil and comprising bridges which form a network between the holes and which have edges forming the rims of the holes, the edges being flanged and ground and the material in the region of the edges having a sub-microscopic, extremely hard martensitic structure containing residual austenite. A process for manufacturing such shear-plates comprises stamping holes into a ribbon of soft, hardenable steel foil containing more than 0.5 percent carbon, flanging and then grinding the edges of the holes with simultaneous pulse heating of the material in the region of the flanged edges up to an austenite forming temperature, and abruptly cooling the ground flanged edges.

3,650,850

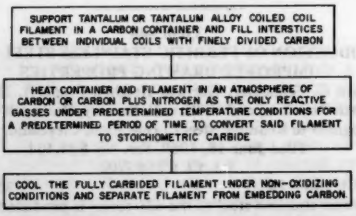
METHOD OF MAKING AN UNDISTORTED COILED-COIL TANTALUM CARBIDE FILAMENT

Richard Corth, 10 Plymouth Road, Nutley, N.J., and Jacob F. Michael, W33 Sycamore St., Paramus, N.J.

Filed Apr. 7, 1970, Ser. No. 26,233

Int. Cl. C23c *9/00*, *11/10*; C22c *29/00*

U.S. Cl. 148—13.1 **8 Claims**


SUPPORT TANTALUM OR TANTALUM ALLOY COILED COIL FILAMENT IN A CARBON CONTAINER AND FILL INTERSTICES BETWEEN INDIVIDUAL COILS WITH FINELY DIVIDED CARBON
HEAT CONTAINER AND FILAMENT IN AN ATMOSPHERE OF CARBON OR CARBON PLUS NITROGEN AS THE ONLY REACTIVE GASSES UNDER PREDETERMINED TEMPERATURE CONDITIONS FOR A PREDETERMINED PERIOD OF TIME TO CONVERT SAID FILAMENT TO STOICHIOMETRIC CARBIDE
COOL THE FULLY CARBIDED FILAMENT UNDER NON-OXIDIZING CONDITIONS AND SEPARATE FILAMENT FROM EMBEDDING CARBON

To carbide coiled-coil tantalum or tantalum alloy filament without causing it to distort, the coiled-coil metal filament is supported in a firing container consisting essentially of carbon as the only container component which will react with tantalum. The interstices between individual coils of the coiled-coil filament are filled with finely divided carbon, preferably graphite. The container and filament are then heated in an atmosphere of carbon or carbon plus nitrogen as the only reactive gases under predetermined temperature conditions and for a predetermined period of time sufficient to convert the filament to stoichiometric carbide.

3,650,851

GALLIUM CONTAINING COLD-ROLLED TRANSFORMER LAMINATIONS AND SHEETS WITH A CUBIC STRUCTURE

Mihaly Stefan; Fulop Balazs; Zoltan Hegedus, and Laszlo Tapolcai, all of Budapest, Hungary, assignors to Csepeli Femmu

Filed July 7, 1969, Ser. No. 839,683

Claims priority, application Hungary, July 17, 1968, SE-1433

Int. Cl. H01f *1/16*; C22c *39/46*, *39/00*

U.S. Cl. 148—31.55 **4 Claims**

Cold-rolled transformer laminations with a cubic structure, containing a maximum of 4 percent by weight of silicon alloyed with 0.0001–0.20 percent by weight of gallium, 0–0.5 percent by weight of nickel and 0–0.5 percent by weight of copper.

3,650,852

SILICONE RESIN COMPOSITIONS

Francis Cecil Davis, and John Chapman Pirie, both of Adrian, Mich., assignors to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

Continuation-in-part of application Ser. No. 714,792, Mar. 21, 1968, now abandoned. This application July 20, 1970, Ser. No. 56,684

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 R **9 Claims**

A silicone resin composition is prepared by adding a zirconium or lead salt of an organic acid to an alkoxylated organosilane and thereafter partially hydrolyzing the reaction product. The composition is amenable to being deposited on a porous substrate in various ways, but is preferably applied in dilute solution in an organic solvent.

3,650,853

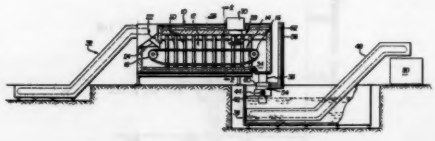
HEAT TREATING METHOD

William R. Keough, Bloomfield Hills, Mich., assignor to Multifastener Company, Detroit, Mich.

Filed Oct. 27, 1969, Ser. No. 869,524

Int. Cl. C21d *1/00*

U.S. Cl. 148—143 **4 Claims**



Heat treating apparatus which includes a heat treating furnace, a chute at the back of the furnace, and a quench bath at the bottom of the chute. The chute has at least one opening in it located at a level above the quench bath, through which a purging gas is injected, and at a slightly higher level the chute has at least one opening in it through which purging gas, furnace atmosphere gas, quench bath fumes and other contaminants are exhausted.

Also included is a method of heat treating objects utilizing the apparatus.

3,650,854

METHOD OF FABRICATING A TRANSISTOR HAVING IMPROVED EMITTER-BASE JUNCTION BREAKDOWN VOLTAGE CHARACTERISTICS

Herbert M. Demsky, Wappingers Falls; Alan Platt, La Grangeville, both of N.Y.; Arthur J. Rideout, Wettswil, Switzerland, and Robert S. Samson, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,467
Int. Cl. H01l 7/44
U.S. Cl. 148—187 7 Claims

A process for producing in a transistor a slumped base profile wherein the base diffusion window is reoxidized, a layer of P_2O_5 is deposited over the oxide, an insulating layer deposited over the P_2O_5, an emitter window opened, and emitter diffusion made.

3,650,855

SOLID ROCKET FUEL COMPOSITION CONTAINING METAL HYDRIDE WITH BUTYL RUBBER AND METHOD OF MAKING SAME

Gerald L. MacKenzie, Redlands, Calif., assignor to Donald G. De Long, Redlands, Calif., a part interest

Filed Dec. 19, 1962, Ser. No. 245,676
Int. Cl. C06d 5/00
U.S. Cl. 149—19 3 Claims

1. A solid fuel composition suitable for use with a liquid oxidizer in a hybrid rocket motor, which comprises a solidly compacted and heat-cured grain having good dimensional stability and strength adequate to resist the stresses of rocket motor combustion, said grain consisting of about 90 percent by weight of lithium hydride and about 10 percent by weight of butyl rubber.

3,650,856

RED PHOSPHORUS CASTABLE SMOKE PRODUCING COMPOSITION

Glen D. Artz, Canoga Park, Calif., assignor to North American Rockwell Corporation

Filed Oct. 6, 1969, Ser. No. 864,159
Int. Cl. C06d 3/00
U.S. Cl. 149—19 11 Claims

A castable pyrotechnic white smoke composition which comprises red phosphorous, an alkali metal nitrate, magnesium and a suitable castable polymeric binder.

3,650,857

GELLED AMINE ROCKET FUELS

George William Burdette, and Dean Henry Couch, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 18, 1965, Ser. No. 496,886
Int. Cl. C06b 15/00
U.S. Cl. 149—36 4 Claims

A gelled amine rocket fuel comprising hydrazine or derivatives thereof, cellulose acetate and hydroxyethylcellulose, for use in modern missile systems.

3,650,858

SURFACE TREATMENT PROCESS FOR SOLID ROCKET PROPELLANT COMPOSITION

Donald Saylak, Lancaster, and Arthur E. Karabela, Edwards, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Feb. 24, 1970, Ser. No. 15,321
Int. Cl. C06b 19/00
U.S. Cl. 149—109 1 Claim

A process for extending the storage and environmental capabilities of cured polymers by depositing an age retardant agent on the surface of the polymer. An age retardant agent such as a plasticizer or antioxidant is dissolved in a low boiling point swelling agent which is compatible with the plasticizer and acts as a solvent therefor. The plasticizer-solvent mixture is then applied to the surface of the polymeric structure, such as a solid propellant rocket motor, in a conventional manner. For example, the solvent mixture can be applied by painting or dipping the structure. The solvent acts as a carrying agent for the plasticizer allowing it to penetrate the surface of the structure to a desired depth.

3,650,859

REGENERATION OF CHROMIC ACID ETCHING SOLUTIONS

Eugene D. D'Ottavio, Thomaston, Conn., assignor to MacDermid Incorporated, Waterbury, Conn.

Filed Sept. 12, 1969, Ser. No. 861,542
Int. Cl. C23f 1/04; C23g 1/36
U.S. Cl. 156—2 6 Claims

A spent chromic acid etching solution, which has been used, for example, to etch plastic substrates, is regenerated by adding, with mixing, an alkali metal permanganate, such as potassium permanganate, and separating the resulting sludge which forms. During the regeneration process trivalent chromium in the etchant is oxidized to hexavalent chromium. The regenerated etching solution, thus recovered, is utilized as an etchant per se or it may be reconstituted with added sulfuric acid and/or chromic acid as required.

3,650,860

METHOD OF MAKING PRINTED CIRCUITS

John H. Rolker, Jr., Monrovia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 22, 1968, Ser. No. 754,668
Int. Cl. H05k 1/00, 3/06; B41n 3/02
U.S. Cl. 156—3 11 Claims

Printed circuits are made by a method which applies a dissoluble magnetizable layer to the electrically conductive coating of a circuit board blank. A magnetic image of the desired circuit is provided in the applied magnetizable layer and etchant-resistive magnetic toner is attracted by the magnetic image to form an etch resist pattern. The electrically conductive coating is then etched with the aid of an etchant and the latter etch resist pattern.

3,650,861

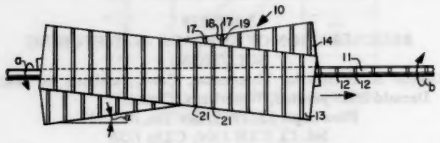
SURFACE TREATMENT OF TITANIUM

Clifford Hyde Angell, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Continuation of application Ser. No. 558,243, June 17, 1966, now abandoned. This application Apr. 27, 1970, Ser. No. 29,769
Claims priority, application Great Britain, July 1, 1965, 27,931/65
Int. Cl. C23f 1/00
U.S. Cl. 156—18 9 Claims

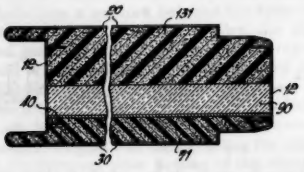
A matt etched surface is provided of titanium metal or titanium alloy, suitable for the deposition of an adhesive coating thereon by treating the surface of the metal or alloy with an aqueous solution of oxalic acid at a temperature greater than ambient temperature. Preferably the concentration of the oxalic acid solution should be greater than five percent.

3,650,862
MARKING APPARATUS AND METHOD
Harvey Burr, Bronxville, N.Y., assignor to Anaconda Wire and Cable Company
Filed Jan. 27, 1969, Ser. No. 794,011
Int. Cl. H01b 19/04
U.S. Cl. 156—51 29 Claims



Stripes are applied to insulated wire by passing it between two endless belts at least one of which carries ink or transverse marking areas. The belts are canted at opposite angles so that the wire is caused to roll across the printing surface.

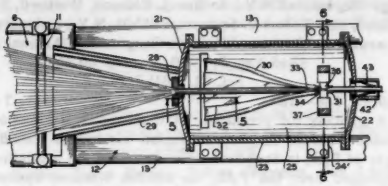
3,650,863
METHOD OF MAKING LAMINATED FOAM-FILLED STRUCTURAL UNITS
Reinhard Klinkosch, Dortmund, Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Germany
Filed July 9, 1969, Ser. No. 840,397
Claims priority, application Germany, July 17, 1968, P 17 79 192.3
Int. Cl. B32b 5/18
U.S. Cl. 156—79 10 Claims



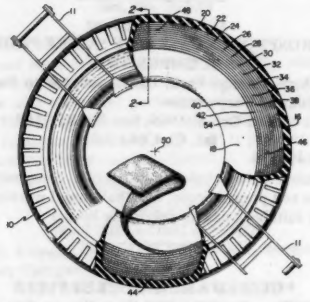
Structural units, and method and apparatus for making the same. Two webs are advanced in spaced parallel predetermined paths. A foam material is deposited on the upper surface of the lower web and foamed to form a foam layer. An intermediate web is applied onto the foam layer. An intermediate layer of sound- or fire-retarding material is applied onto the intermediate web, and the space between the intermediate layer and the upper web has foam material introduced thereinto and converted into a foam layer, whereby to obtain an elongated structural laminar unit consisting of the various layers and webs which adhere to one another.

3,650,864
METHOD FOR MAKING FILAMENT REINFORCED A-STAGE PROFILES
William B. Goldsworthy, Palos Verdes Estates, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.
Continuation-in-part of application Ser. No. 674,820, Oct. 12, 1967, now Patent No. 3,576,705. This application July 23, 1969, Ser. No. 844,022
Int. Cl. B32b 31/04
U.S. Cl. 156—85 20 Claims

Fiberglass filament unwound from a series of spools is impregnated with a resin matrix and passed through a pair of rollers or sizing bushing for removing the excess resin and air therefrom. The resin impregnated fiberglass is then envelopely enclosed within a sheet of unidirectionally oriented plastic film, the latter being sealed along its upper longitudinal margin by means of an ultrasonic weld or heat weld. The film enclosed composite may then be heated to shrink the film. The temperature should be sufficiently low to have no curing effect on the resin leaving it in the uncured or so-called "A-stage." For some systems, it is desirable to advance the resin to a semicured or so-called "B-stage." The film enclosed composite may then be wound upon suitable reels and stored for further use.



3,650,865
METHOD OF INFLATING TIRES WITH FOAMABLE MATERIAL
Joseph S. Hawkes, Silver Lake, and David L. Turk, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 15, 1969, Ser. No. 884,849
Int. Cl. B29h 13/00
U.S. Cl. 156—119 28 Claims

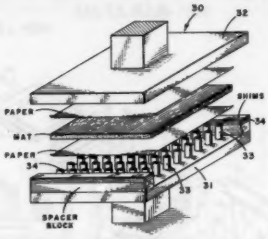


A method for producing a tire inflated with foamable material such as synthetic rubber. A number of preformed strips of unfoamed material are annularly layered within a tire, the first layer being against the inside crown of the tire. Any joints between successive layers are arcuately staggered. The layers of unfoamed material are compacted or compressed against each other and the tire, forming a laminated, foamable, annular insert within the tire cavity. A predetermined amount of unfoamed material is uniformly placed within the tire to give a desired tire pressure, when the material is foamed.

3,650,866
INCREASING STRIP TENSILE STRENGTH OF MELT BLOWN NONWOVEN POLYPROPYLENE MATS OF HIGH TEAR RESISTANCE
James S. Prentice, Baytown, Tex., assignor to Esso Research and Engineering Company
Filed Oct. 9, 1969, Ser. No. 865,108
Int. Cl. B32b 31/00
U.S. Cl. 156—181 4 Claims

The strip tensile strength of a highly tear resistant nonwoven mat of melt blown polypropylene fibers having a

diameter between about 10–40 microns is increased, while maintaining a high mat tear resistance, by fuse-bonding, as by calendering or point-bonding, at least a portion of the fibers



of the mat at temperatures not greater than about 225° F., preferably, between about 170°–210° F., under pressure sufficient to prevent shrinkage of the fibers of the mat.

3,650,867

METHOD OF PRODUCING LAMINATED TEXTILE FABRICS WITH IMPROVED DIMENSIONAL STABILITY

Jackson Bauer, Croydon, Pa., assignor to Collins and Aikman Corporation, New York, N.Y.

Filed June 25, 1969, Ser. No. 836,479
Int. Cl. B31f *1/12*
U.S. Cl. 156—183 **8 Claims**

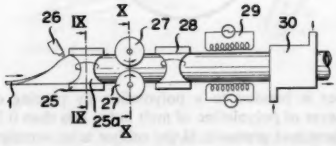
A method is provided for producing laminated textile fabrics with improved dimensional stability. In the present method, a laminate comprised of at least one ply of a textile fabric and at least one ply of a foam which plies are laminated together with an uncured to partially cured adhesive is compacted and then cured. The laminated textile fabrics of this invention are especially useful in the manufacture of wearing apparel, but also find uses in home furnishings and in industrial applications.

3,650,868

METHODS AND APPARATUS FOR MANUFACTURING PIPE-SHAPED ARTICLES FROM FOAMED THERMOPLASTIC RESIN

George Murota, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1969, Ser. No. 808,806
Claims priority, application Japan, Mar. 27, 1968, 43/19412
Int. Cl. B29d *23/10*
U.S. Cl. 156—203 **18 Claims**



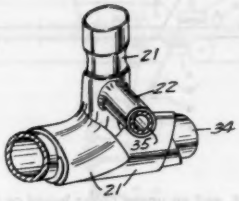
Methods and apparatus for manufacturing pipe-shaped articles from foamed thermoplastic resin which comprise turning the foamed thermoplastic resin sheet such as foamed polyethylene, foamed polypropylene, or foamed polyvinyl chloride, heating the abutting or contacting surfaces of the sheet and joining the sheet.

3,650,869

PROTECTIVE PAD AND METHOD OF USING

Stanley M. Lindell, Richfield, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 7, 1969, Ser. No. 839,323
Int. Cl. B32b *3/04, 3/10*
U.S. Cl. 156—212 **5 Claims**



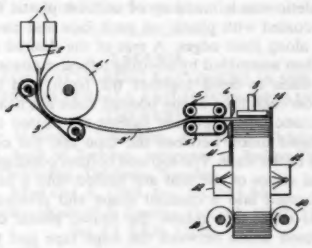
Service connections to gas mains are protected against external corrosive influences by covering with a protective mastic sheet material which is slit in a pattern permitting complete void-free coverage by simple and rapid hand application.

3,650,870

PROCESS FOR THE CONTINUOUS MANUFACTURE OF CAPILLARY BLOCKS

Hans-Joachim Dietzsch, Villars sur Ollon Vaud/Rhine Schaffhausen, and Ottot Dietzsch, Stein am Rhein SH, both of Switzerland, assignors to INVENTA AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Sept. 3, 1969, Ser. No. 854,984
Claims priority, application Switzerland, Sept. 5, 1968, 13371
Int. Cl. B32b *31/30*
U.S. Cl. 156—264 **11 Claims**



A process for the continuous production of block materials containing capillaries in side-by-side relationship comprising producing a plurality of capillary tubes having longitudinal axes adhering the tubes together to form a capillary web, drawing off said web, cutting said web transversely of said axes at predetermined intervals, to form relatively shallow web pieces having flat faces, placing said pieces with the faces in contact with one another affixing said pieces to one another to form a continuous block.

3,650,871

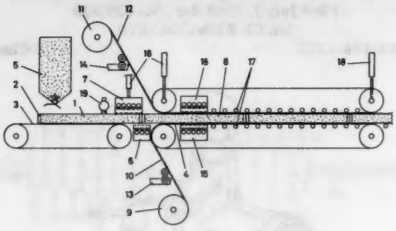
METHOD OF PRODUCING INSULATING PANELS

Karl Waldemar Bentfors, Utsiktsvagen 14, Motala, Sweden

Filed June 9, 1969, Ser. No. 831,508
Int. Cl. B32b *31/00, 5/20*
U.S. Cl. 156—269 **1 Claim**

A method for producing insulated panels of a honeycomb structure surrounded by a frame, in which the panels are continuously fed below a discharging device which fills the

honeycomb with polystyrene, granular or ground waste material having insulating properties. Before or after filling, the honeycomb structure may be closed by a subjacent cover



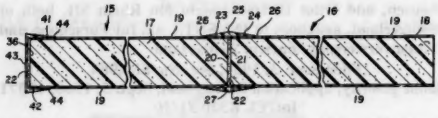
board or sheet, and an upper cover board or sheet is applied after filling, the upper and lower cover boards or sheets being adhesively bonded to the honeycomb.

3,650,872

METHOD OF MAKING ATHLETIC MATS

Eugene McKiernan, Dublin, Ireland, assignor to Voplex Corporation, Rochester, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,241
Int. Cl. B29c *19/00*
U.S. Cl. 156—304 **14 Claims**



An athletic mat is made up of uniform plastic foam slabs that are coated with plastic on each face and covered with adhesive along their edges. A mat of the desired shape and color is then assembled by abutting adhesive coated edges of selected slabs to bond together the foam; and the plastic coatings on each face of the bonded slabs are heated, and a heated plastic tape is pressed against the heated coatings to form a fused union between the tape and the coatings on each face of the slabs. The top and bottom coatings along the peripheral edges of the mat are heated, and a heated edge tape is formed into a channel shape and pressed over the peripheral edges and against the heated plastic coatings to form a fused union between the edge tape and the plastic coatings.

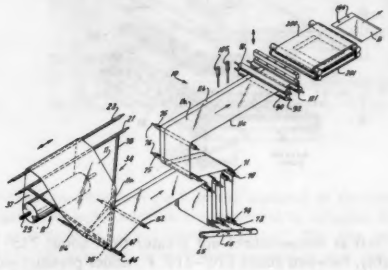
3,650,873

BAG MAKING MACHINE HAVING HEAT SEALER WHOSE DWELL TIME IS ADJUSTABLE

William E. Smith, Upper Saddle River, N.J.; Edward P. Primosch, Franklin Square, N.Y., and John D. Keenan, Jr., Caldwell, N.J., assignors to Amsco Packaging Machinery, Inc.

Filed Oct. 7, 1968, Ser. No. 765,316
Int. Cl. B32b *31/20*
U.S. Cl. 156—465 **10 Claims**

The web from a roll of thermoplastic sheet material folded longitudinally, and the folded web passes around dancer rods, then between feed rollers and over a platen roller. A heated sealing and severing bar is alternately moved against the folded web to press it against the platen roller to heat seal and sever the folded web transversely, and away from the folded web, in timed relation with the speed of feed of web by the feed rollers to form bags of uniform width, each open at one end. The feed of the web is stopped each time the sealing bar presses against the folded web. The dwell time and pressure of the sealer can be adjusted. The width of the bags can be adjusted. The formed bags are delivered for stacking. When tension on the web slackens, the roll of the



web material is correspondingly braked. Each time a predetermined number of bags are made, the feed rollers stop feeding and the sealing bar is held away from the web on the platen to permit each delivered stack of bags to be removed, before resuming the bag making operation.

3,650,874

ADHERING RUBBERS AND POLYOLEFINES BY OTHER THAN PEROXIDE CURING AGENTS

Claude Job, Paris; Yvan Landler, Sceaux; Pierre Henri Lebel, Reuil-Malmaison, and Lucile Meillat, Paris, all of France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Keber-Colombes, Colombes (Hauts de Seine), France

Continuation-in-part of application Ser. No. 523,558, Jan. 28, 1966, now abandoned. This application Mar. 6, 1969, Ser. No. 804,915
Claims priority, application France, Mar. 15, 1968, 144124; 144126; 144127; 144128; Nov. 6, 1968, 172836
Int. Cl. B32b *15/02, 25/08;* C09j *3/14*
U.S. Cl. 161—217 **30 Claims**

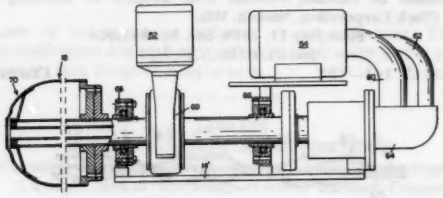
A rubber is bonded to a polyolefine by placing on the rubber a layer of polyolefine of melt index less than 0.15 and applying heat and pressure. If the rubber is an unvulcanized mix containing a vulcanizing agent, the temperature, pressure and duration should be sufficient to cause vulcanization of the rubber. If the rubber is partly or fully vulcanized the pressure used is at least 10 kg./cm.^{2} and the polyolefine is heated to at least its melting point. The low melt index polyolefine may be in the form of a powder, powder suspension, film or sheet, which can thus be used to adhere a higher melt index polyolefine to the rubber. Various integral rubber/polyolefine articles are produced by this method.

3,650,875

AUTOMATIC MANUFACTURE OF CLOTHING

George H. Kendall, Sr., New London, Conn., assignor to Kendall-Russell, Inc., Marblehead, Mass.

Filed Sept. 3, 1969, Ser. No. 854,969
Int. Cl. B32b *1/00*
U.S. Cl. 156—559 11 Claims



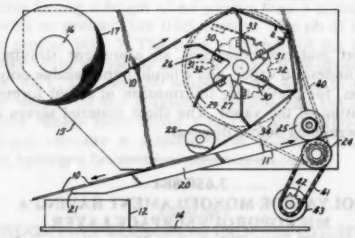
A continuous conveyor, a series of pallets mounted thereon, a tooling station on each pallet, a work nest mounted in association with each tooling station, means automatically applying garment parts having dry adhesives thereon in a predetermined relation to the work nests so that the various garment parts are correctly aligned and overlap each other to a certain degree, and automatic means providing for activating the adhesive, securing said garments in the relationship in which they were deposited on the various work nests.

3,650,876

ARTICLE POSITIONING AND CONTROL MECHANISM

Wilfred E. Stageberg, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1969, Ser. No. 817,528
Int. Cl. B32b
U.S. Cl. 156—584 13 Claims



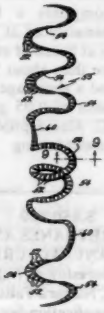
An apparatus for registering articles releaseably adhered to a liner with a predetermined station for printing, punching, dispensing, etc. The apparatus includes a movable article guide- and registering-member comprising spaced transversely extending blades engageable with the strip of articles and positioned a predetermined distance from said station such that upon movement of the articles toward said predetermined station and movement of said registering member a predetermined extent the desired position of the articles relative to the station may be readily maintained.

3,650,877

CUSHIONING DUNNAGE PRODUCT

George R. Johnson, Chagrin Falls, Ohio, assignor to The Arpax Company, Chagrin Falls, Ohio

Original application May 22, 1967, Ser. No. 640,145. Divided and this application Oct. 6, 1969, Ser. No. 863,856
Int. Cl. B32b *3/28*
U.S. Cl. 161—47 4 Claims



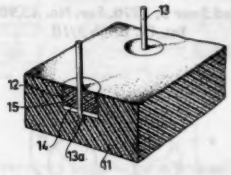
A resilient cushioning dunnage product of helical coil like configuration produced from a web of low cost sheet like material, such as paper, by crumpling the web down into a relatively narrow strip and then forming the strip by pressure into generally helical coiled form. Also a tubular like dunnage product formed by taking a web of flexible sheet like material, such as paper, forming the web into generally tubular-like shape by moving lengthwise edges of the web inwardly toward one another and then loosely crumpling the tubular-like product and stitching it along the lengthwise extent thereof to maintain the formed configuration.

3,650,878

METHOD FOR ANCHORING FASTENERS IN CELLULAR PLASTIC MATERIALS AND JOINTS OBTAINED THEREBY

Erik Harry Mattsson, Tidaholm, and Hans Ulrich Wurth, Ekedalen, both of Sweden, assignors to Bofors-Tidaholm-sverken Aktiebolag, Tidaholm, Sweden

Filed Oct. 8, 1968, Ser. No. 765,903
Claims priority, application Sweden, Oct. 12, 1967, 13972/67
Int. Cl. B32b *33/00*
U.S. Cl. 161—48 1 Claim



A strong direct joint between a fastener element and a block of cellular plastic material is obtained by providing a wide contact surface between the element and the block and then providing a layer of hardenable plastic material in the space between the element and the block.

3,650,879

MANUFACTURE OF UNIQUE POLYETHYLENE TEREPHTHALATE FIBER

Johannes Pieter Munting, Emmen, Netherlands, assignor to Akzona Incorporated, Enka, N.C.

Filed Aug. 25, 1969, Ser. No. 852,915
Claims priority, application Netherlands, Aug. 31, 1968, 6812442
Int. Cl. B32b *11/02*
U.S. Cl. 161—89 8 Claims

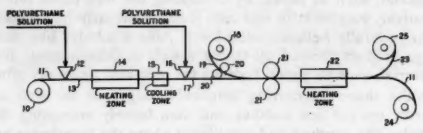
A fiber especially suitable for reinforcing bitumen-containing materials which comprises a fiber of polyethylene terephthalate having a tenacity of at least about 7.5 grams per denier, an elongation at break of at least about 9 percent, an elongation of not more than about 5 percent under a load of 5 grams per denier and a shrinkage of less than 4 percent when kept under a tension of 0.05 grams per denier for 4 minutes at about 160° C. Also a process for producing this fiber and a bitumen-containing structure reinforced therewith are disclosed.

3,650,880

POROUS POLYURETHANES AND METHOD OF MANUFACTURE

Albert C. Tieniber, Moorestown, N.J., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 691,220, Dec. 18, 1967, now abandoned. This application Nov. 20, 1968, Ser. No. 777,428
Int. Cl. B32b *3/00, 27/12*
U.S. Cl. 161—89 15 Claims



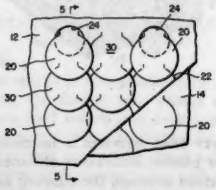
A porous, breathable, polymer-coated fabric is produced by applying a layer of film-forming flexible polyurethane solution to a carrier member; heating said layer sufficiently to form a solidified film on said carrier member; cooling said film and carrier member; applying a second layer of film-forming polymer solution on the first film on the member; applying to said second layer a fabric material; and heating the resulting structure to form an unitary article comprised of the fabric and both polymer layers. The carrier member can be stripped from the first polymer layer. Plastic films can also be produced.

3,650,881

DECORATIVE PANEL ASSEMBLY

Anthony J. Giannone, Sr., Route 2, P.O. Box 240, Saugerties, N.Y.

Filed June 5, 1970, Ser. No. 43,906
Int. Cl. B32b *3/10*
U.S. Cl. 161—111 3 Claims



A flexible decorative panel assembly having front and rear members joined together in co-planar relationship. Both members have flaps located over apertures formed in their surfaces. The flaps of the rearward member protrude through the apertures in the front member. The apertures in each member are offset from the apertures in the other member, and the flaps hide the apertures from sight to give a decorative shingle effect to the front surface of the assembly.

3,650,882

MULTI-PLY PAPER TOWEL

Gordon D. Thomas, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed July 11, 1969, Ser. No. 841,004
Int. Cl. B32b *3/28, 7/14*
U.S. Cl. 161—122 4 Claims

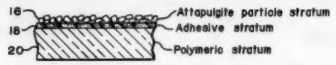
A multi-ply absorbent creped cellulose wadding paper tissue material in which an elastically extensible inner web of creped tissue paper has on its major faces at least one embossed paper tissue material of greater dryer basis weight and lesser extensibility. The outer webs are bonded to the inner web (or webs) in spaced regions to provide unbonded zones between bonds. The adhesive is sufficiently water resistant to permit retention of the webs when wetted so that the inner creped web may expand and fill the unbonded zones providing good bulk in the wet product. Methods of effecting the web combinations are described.

3,650,883

VAPOR CONTROL SHEET MATERIAL

Robert Sweeney, 10 Wilton Drive, Wilmington, Mass.

Filed July 17, 1969, Ser. No. 842,659
Int. Cl. B32b *5/16*; B05b *7/00*
U.S. Cl. 161—162 3 Claims



A sheet material comprises an absorbent stratum, for trapping undesired vapor, and a liquid impermeable polymeric stratum, for preventing transmission of liquid formed by condensation of the vapor. The sheet material serves as an exterior wrapping before disposal.

3,650,884

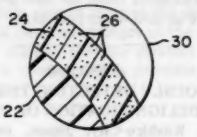
POLYAMIDE MONOFILAMENT HAVING A MICROPOROUS SURFACE LAYER

John Edward Hansen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 834,213, June 9, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 616,956, Feb. 17, 1967, now abandoned, and a continuation-in-part of 850,665, Aug. 15, 1969, which is a continuation-in-part of application Ser. No. 673,287, Oct. 6, 1967, now abandoned. This application July 20, 1970, Ser. No. 56,383
Int. Cl. D02j *3/00*
U.S. Cl. 161—175 6 Claims

Highly drawn polyamide monofilaments having a diameter of at least 15 mils which have been subjected to steam at specified conditions possess properties that render them particularly suitable in tires. The steam-modified surface layer of

the monofilament is microporous, resulting in a dye-penetration of 3–15 microns which depth constitutes less than 6 per-



cent of the transverse radius of the monofilament. The monofilament has an X-ray orientation half-width that is no greater than about 12.5 degrees-chi.

3,650,885
RADIATION-CURABLE COMPOSITIONS

Gerald I. Nass, West New York, and Gerhard E. Sprenger, Carlstadt, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,756
Int. Cl. B32b *5/02*; **C08d** *1/00*; **C08f** *1/16*
U.S. Cl. 161—189 **19 Claims**

Radiation-curable compositions consisting of (a) an ethylenically unsaturated ester of 1,4,5,6,7,7-hexahalo-2,3-bis(hydroxymethyl)-bicyclo(2,2,1)-5-heptene, tetrahalobenzene-dimethanol, or 2,2'[isopropylidene bis(2,6-dihalophenoxy] dipropylene oxide diol and (b) acyloin, an acyloin derivative, or a halogenated aromatic, alicyclic, or aliphatic hydrocarbon are useful as printing inks, coatings, adhesives, printing plates, and the like.

3,650,886
FORMATION OF COLLOIDAL SUSPENSIONS OF CHRYSOTILE ASBESTOS BY TREATMENT WITH HYDROGEN SMECTITES

Andrew Torok, Parsippany, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.

Filed Feb. 26, 1970, Ser. No. 14,655
Int. Cl. C03b *37/00*
U.S. Cl. 162—3 **14 Claims**

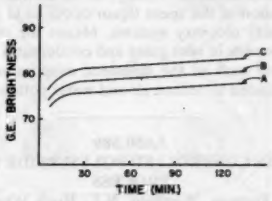
A method for preparing a colloidal suspension wherein an aqueous slurry of water, chrysotile asbestos, and hydrogen smectite is subjected to a shearing action until the slurry is a colloidal suspension of hydrogen smectite and asbestos, the ultimate particle size of at least 90% of the chrysotile asbestos having a length of no greater than 3 microns and a diameter no greater than 0.05 microns. The ph of the slurry is no greater than 5. The ratio by weight of the hydrogen smectite to the chrysotile asbestos ranges from about 1–30 to about 30–1. The ratio by weight of the water to the combined weights of the chrysotile asbestos and the hydrogen smectite ranges from about 100–1 to about 100–10. The hydrogen smectite is selected from hydrogen montmorillonite, hydrogen hectorite, or mixtures thereof.

3,650,887
WOOD PULP BLEACHING PROCESS UTILIZING PEROXIDE-SILICATE BLEACHING SOLUTION

Donald H. Grangaard, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of application Ser. No. 546,066, Apr. 28, 1966, now abandoned. This application Apr. 21, 1969, Ser. No. 826,756. The portion of the term of this patent subsequent to Apr. 21, 1987, has been disclaimed.
Int. Cl. D21c *9/16*
U.S. Cl. 162—25 **5 Claims**

A process of bleaching defibered hardwood pulp with a peroxide-silicate composition to attain in a single bleaching step a brightness (General Electric) of 80+. The procedure requires a plurality of controlled conditions including bleaching time, temperature, pulp consistency, pH, sodium silicate and alkalinity concentrations, and particularly a peroxide solution concentration in actual contact with the pulp of between about 0.4 and 1.2 percent based on the weight of the aqueous bleach solution itself including any water in the pulp. The bleaching takes place at a consistency

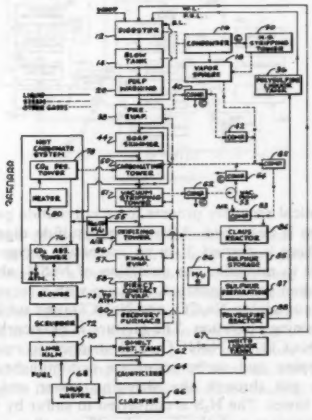


such that initially at least 3 percent by weight of peroxide based on the air dry pulp weight is present. Brightnesses well in excess of 80 are attained in a single bleaching step, and pre-treatment of pulp with barium chloride is effective in the attainment of such brightnesses at relatively low temperatures with reasonable peroxide consumptions.

3,650,888
POLLUTION CONTROLLED POLYSULFIDE RECOVERY PROCESS

Carl Bertil Fogman, Westfield, N.J.; Hugh Wharton Nelson, West Hartford, Conn., and Utah Tsao, Jersey City, N.J., assignors to Combustion Engineering, Inc., Windsor, Conn., by said Nelson and Lummus Company, Bloomfield, N.J., by said Fogman and Tsao

Filed June 11, 1970, Ser. No. 45,455
Int. Cl. D21c *11/04*
U.S. Cl. 162—30 **22 Claims**



A chemical recovery process for a polysulfide paper pulping system is described. After the polysulfide digestion, the pulp washing is carried out in an essentially oxygen-free environment to minimize the oxidation of NaSH. The spent liquor is pre-evaporated and mixed with a recycle stream of liquor containing Na_2CO_3 and $NaHCO_3$. The mixture is next carbonated with a gas stream rich in CO_2 which has been generated from lime kiln flue gas. The carbonated spent liquor is then vacuum stripped to release H_2S which is con-

verted to sulfur. The sulfur is mixed and reacted with Na_2S in at least part of the white liquor to form sodium polysulfide. The polysulfide liquor and any remaining white liquor are returned to the digester.

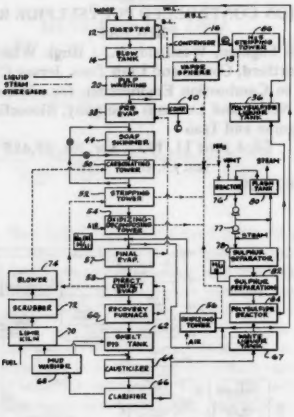
The pH of the desulfurized liquor from the vacuum stripping operation is increased to about 12.5 by the addition of make-up NaOH and recycled and oxidized white liquor. The resulting mixture is then evaporated to about 50 percent dry solids concentration. Finally, direct contact evaporation and combustion of the spent liquor occur as in conventional kraft chemical recovery systems. Means for recovering all sulfur compounds in vent gases and condensates from all mill process unite such as the digesters, evaporators, lime kiln, etc., are included to reduce air and water pollution.

3,650,889

POLLUTION CONTROLLED POLYSULFIDE RECOVERY PROCESS

Carl Bertil Fogman, Westfield, N.J.; Hugh Wharton Nelson, West Hartford, Conn., and Utah Tsao, Jersey City, N.J., assignors to Combustion Engineering, Inc., Windsor, Conn., by said Hugh Wharton Nelson and The Lummus Company, Bloomfield, N.J., by said Carl Bertil Fogman and Utah Tsao

Filed Aug. 3, 1970, Ser. No. 60,568
Int. Cl. D21c *11/04*
U.S. Cl. 162—30 **15 Claims**



A chemical recovery process for a polysulfide paper pulping system is described. After the polysulfide digestion, the pulp washing is carried 3. in an essentially oxygen-free environment to minimize the oxidation of NaSH. about spent liquor is then pre-evaporated, makeup with a recycle stream of liquor containing Na_2CO_3 and $NaHCO_3$ and subjected to a soap skimming operation. The mixture is next carbonated to convert Na_2CO_3 to $NaHCO_3$ and stripped to release H_2S. The stripping and carbonation are accomplished by passing flue gas through the stripping tower and the carbonating tower. The H_2S is converted to sulfur by the use of a liquid catalyst and the formed sulfur is then mixed and reacted with Na_2S in at least part of the white liquor to form sodium polysulfide. The polysulfide liquor and any remaining white liquor are returned to the digester.

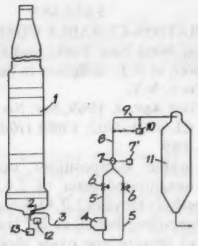
The desulfurized liquor from the stripping operation is subjected to an oxidizing-decomposing operation to oxidize residual sulfides and decompose residual $NaHCO_3$. The pH of the so treated liquor is then increased to about 12.5 by the additon of makeup NaOH and recycled and separately oxidized white liquor. The resulting mixture is then evaporated to about 50 percent dry solids concentration. Finally, direct contact evaporation and combustion of the spent liquor occur as in convention kraft chemical recovery systems. Means for recovering all sulfur compounds in vent gases and condensates from all mill process units are included to reduce air and water pollution.

3,650,890

CONTINUOUSLY DETECTING THE DEGREE OF DELIGNIFICATION OF PULP

Shigeo Kamio, Kushiro-City, Japan, assignor to Honshu Paper Manufacturing Company Limited, Tokyo, Japan

Filed Apr. 3, 1969, Ser. No. 813,260
Claims priority, application Japan, June 19, 1968, 43/41884
Int. Cl. D21c *7/12*
U.S. Cl. 162—49 **5 Claims**



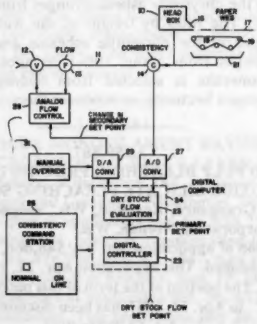
A process for continuously detecting the degree of delignification of pulp in a continuous digester wherein pressure drop in a length of pipe located downstream of the digester, between a blow tank and an accumulator, is measured and used to compute the degree of delignification of the pulp. Pulp flow through the pipe and consistency of the pulp leaving the digester can also be used in obtaining a more accurate determination of the degree of delignification.

3,650,891

SYSTEM FOR MAINTAINING CONSTANT THE DRY MATERIAL FLOW TO A SHEET MATERIAL MANUFACTURING MACHINE

Erik B. Dahlin, Saratoga, Calif., assignor to Measurex Corporation, Santa Clara, Calif.

Filed Apr. 7, 1969, Ser. No. 814,100
Int. Cl. D21f *1/06*
U.S. Cl. 162—259 **5 Claims**



The stockline valve of a paper making machine is regulated by comparing by means of a digital computer successive readings of the consistency of the paper pulp carried by

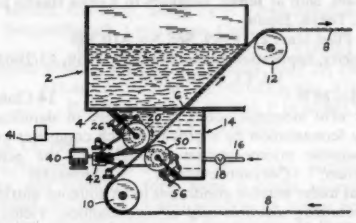
a water carrier. Any resultant difference between such readings is converted to analog information and coupled to the set point of an analog flow control unit which is responsive to the actual flow rate to control the stock valve. The digital computer will perform changes of the flow controller set point in such a manner that the product of consistency and flow set point is constant. This provides control of the pulp flow in the line.

3,650,892

STOCK TANK SEALING MEANS FOR PAPERMAKING

Heinz Genz, Willich; Heinz Liborius, Duesseldorf; Dieter Pfleiderer, Lahnstein; Karl Schmidt, Duesseldorf; Dieter Berger, and Horst Seeliger, both of Lahnstein, all of Germany, assignors to Feldmuehle Aktiengesellschaft, Dusseldorf, Germany

Filed July 11, 1969, Ser. No. 840,939
Claims priority, application Germany, July 15, 1968, P 17 61 854.1
Int. Cl. D21f *1/00, 1/32*
U.S. Cl. 162—275 **7 Claims**



The screen inlet to the stock tank is sealed to prevent loss of stock water by a water chamber. The seal water pressure is adjustable. The chamber is sealed with reference to the screen by two rollers each of which is in close proximity to but not in contact with an opposite side of the screen and is driven in either direction at variable speed. The gap between rollers and screen is adjustable to accommodate different screen gages, different concentrations of fiber suspension, different stock levels and other operating conditions.

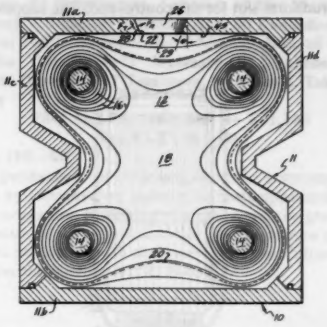
3,650,893

PORT PLUG FOR A PLASMA-CONFINING CAVITY

Neil C. Lien, Evansville, Wis., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 2, 1969, Ser. No. 881,356
Int. Cl. G21b *1/00*
U.S. Cl. 176—1 **7 Claims**

A body defining a cavity confining a plasma in a partial vacuum includes an inwardly tapering conical aperture permitting access to the cavity and a truncated-conical plug sized to engage the aperture in removable-deformable fit engagement a distance along the length of the aperture from the cavity-defining interior walls of the body greater than the resistive skin depth of the body. The plug is further sized to seal the cavity flush with the interior walls of the body and the sides of the plug and the conical aperture are generated at an angle θ relative the vertical such that θ has a value less



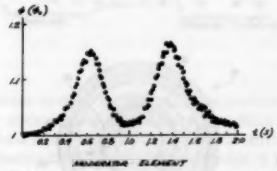
than tan $\theta = 1/\mu$ and greater than tan $\theta = \mu$, wherein μ is the coefficient of static friction between the plug and the body.

3,650,894

METHOD OF MEASURING THE NUCLEAR PHYSICAL BEHAVIOR OF BODIES

Wilfried Rausch, Dollweg; Claus Benedikt Von Der Decken, Verlautenheide/Aachen, and Klaus-Peter Bachus, Aachen, all of Germany, assignors to Brown, Boveri/Krupp Reaktorbau GmbH

Continuation-in-part of application Ser. No. 554,803, June 2, 1966, now abandoned. This application Oct. 22, 1968, Ser. No. 769,573
Claims priority, application Germany, June 10, 1965, B 82346
Int. Cl. G21c *17/06*
U.S. Cl. 176—12 **9 Claims**



A method of measuring the neutron-physical behavior of elements to be examined, particularly in sampling elements from the core of a nuclear reactor, comprising introducing the elements in a continuous or substantially continuous flow into a critical facility, conducting the elements in continuous or substantially continuous motion through the critical facility with the time interval spent by the individual elements in the critical facility being less than 10 seconds, and measuring the change in the system parameters of the facility.

3,650,895

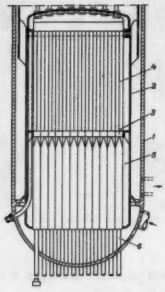
GUIDE TUBE FOR A CONTROL ROD IN A NUCLEAR REACTOR

Bengt Martin Sodergard, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 22, 1968, Ser. No. 723,061
Claims priority, application Sweden, Apr. 25, 1967, 5787/67
Int. Cl. G21c *1/08*
U.S. Cl. 176—44 **2 Claims**

In a BLWR exchangeable guide tubes for cruciform control rods are indirectly supported by the bottom of the reac-

tor vessel and carry at their upper ends square support blocks, each being provided with four holes for four fuel assemblies, said holes being symmetrically distributed around a central cruciform slot for the control rod. The support blocks



are arranged in an edge to edge relationship, thus forming an even bottom for the core volume. Each guide tube has at its upper end four depressions, thereby obtaining a cruciform cross section and permitting flow of coolant from outside the tubes to the fuel assemblies.

3,650,896

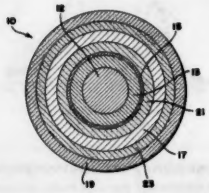
NUCLEAR FUEL PARTICLES

Walter V. Goeddel, Poway, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 9, 1969, Ser. No. 865,017

Int. Cl. G21c *3/06*

U.S. Cl. 176—68 **8 Claims**



Nuclear fuel particles having fissile or fertile central cores surrounded by a buffer layer of low density pyrolytic carbon. A shell of dense silicon carbide, zirconium carbide or niobium carbide surrounds the buffer layer, and a layer of isotropic pyrolytic carbon may be disposed therebetween. To maintain the dense carbide shell in compression during the fuel particle lifetime, an outer isotropic carbon shell is provided which shrinks down onto the carbide shell as a result of high temperature, fast neutron irradiation. To prevent stresses of too great a magnitude from being created early in the fuel particle lifetimes, an intermediate layer of compressible pyrolytic carbon is disposed immediately exterior of the carbide shell. Nuclear reactors utilizing such particles can be operated at temperatures about 800° C. to a fast neutron dosage over 4×10^{21} neutrons/cm.^{2} while maintaining good fission product retentivity within the coated fuel particles.

3,650,897

PROCESS FOR PRODUCING 5-FLUOROURACIL RIBOSIDE AND 6-MERCAPTOPURINE RIBOSIDE

Kiyoshi Nakayama, Sagamihara-shi; Takashi Nara, Tokyo; Masanaru Misawa, Kawasaki-shi, and Toshio Komuro, Machida-shi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of application Ser. No. 565,089, July 14, 1966, now abandoned. This application July 15, 1968, Ser. No. 744,690

Claims priority, application Japan, July 19, 1965, 40/43227

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 N **9 Claims**

A process for producing 5-fluorouracil or 6-mercaptopurine riboside by fermentation which comprises culturing a micro-organism belonging to *Bacillus subtilis* or *Streptomyces fradiae* in an aqueous nutrient medium under aerobic conditions. In the case of 5-fluorouracil riboside, 5-fluorouracil is added to the medium and in the case of 6-mercaptopurine riboside, 6-mercaptopurine is added to the medium. The products have been reported as being useful as antagonistic agents of nucleic acid metabolism and as anti-cancer agents.

3,650,898

PROCESS FOR PRODUCING NICOTINIC ACID MONONUCLEOTIDE

Kiyoshi Nakayama, Sagamihara-shi, and Haruo Tanaka, Machida-shi, both of Japan, assignors to Kyowa Hakko Kogyo, Ltd., Tokyo, Japan

Filed Mar. 25, 1969, Ser. No. 810,349

Claims priority, application Japan, Mar. 29, 1968, 43/20057

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 N **14 Claims**

Nicotinic acid mononucleotide is produced in significant amounts by fermentation by a process which comprises culturing a suitable microorganism belonging to the genus Brevibacterium, Corynebacterium, Arthrobacter or Micrococcus under aerobic conditions in an aqueous nutrient medium containing nicotinic acid or nicotinamide. Yields of greater than 2 mg./ml. are obtained in some cases.

3,650,899

PROCESS FOR PRODUCING L-PROLINE

Yuichi Noguchi; Toru Nakanishi, and Yasuyuki Taketugu, all of Hofu-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of application Ser. No. 696,493, Jan. 9, 1968, now abandoned. This application June 14, 1968, Ser. No. 736,957

Claims priority, application Japan, Jan. 13, 1967, 42/2180

Int. Cl. C12d *1/02*

U.S. Cl. 195—29 **13 Claims**

A process for producing L-proline by fermentation which comprises culturing a micro-organism capable of producing L-proline under aerobic conditions in an aqueous nutrient medium containing biotin, in an amount at least sufficient for the growth of the bacterial cells, and at least 0.5 mole per liter each of ammonium ion and chloride ion. A convenient supply of the said ions is ammonium chloride. Preferred micro-organism are Micrococcus glutamicus ATCC 21157, 21158 and 21159.

3,650,900

INSOLUBLE POLYMER-ENZYME PRODUCTS

Yehuda Levin, Tel-Aviv; Shmaryahu Blumberg, Rishon le Zion; Ephraim Katchalski, and Leon Goldstein, both of Rehovot, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovoth, Israel

Filed Sept. 27, 1968, Ser. No. 763,254

Int. Cl. C12k *1/00*; C07g *7/02*

U.S. Cl. 195—63 **8 Claims**

insoluble polymer enzyme products having covalently bonded therein a member selected from the group consisting of dialkyamino-alkylamines, alkylmonamines and aminoloweralkanols.

3,650,901

POLYMERIC ENZYME PRODUCTS

Ephraim Katchalski; Leon Goldstein, both of Rehovot; Yehuda Levin, Tel-Aviv, and Shmaryahu Blumberg, Rishon le Zion, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Sept. 27, 1968, Ser. No. 763,128
Int. Cl. C12k 1/00; C07g 7/02
U.S. Cl. 195—63 40 Claims

Method of preparing active polymer-enzyme products by reaction or coupling of the polymer with an enzyme derivative in which a reactive group is inactivated and subsequently restoring the activity of the inactivated group, and at least partially inactivated intermediate polymer-enzyme products. Process is conducted with greater facility, and permits higher yields of desired polymer-enzyme product and attainment of higher percentage of activity in polymer-enzyme product. Intermediate polymer-enzyme products thus-produced.

3,650,902

PROCESS FOR THE STABILIZATION AND PURIFICATION OF L-ASPARAGINASE

Otto Wagner; Klaus Bauer, both of Wuppertal-Elberfeld; Wilfried Kaufmann, Wuppertal-Vohwinkel; Erich Rauenbusch; Alfred Arens, and Eckart Irion, all of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 28, 1969, Ser. No. 828,601
Claims priority, application Germany, May 29, 1968, P 17 67 617.4; July 16, 1968, P 17 92 043.3; Nov. 7, 1968, P 18 07 447.0; Nov. 9, 1968, P 18 08 042.7
Int. Cl. C07g 7/02
U.S. Cl. 195—66 A 4 Claims

L-asparaginase is obtained in a highly purified, pyrogen free and stabilized form from a crude aqueous solution thereof, by adding to said solution an amino acid, such as glycine, adjusting the pH of the solution to from 7.0 to 9.2, preferably in the presence of a lower aliphatic alcohol, such as methanol, then heating the solution for a period of from 1 to 5 days at a temperature up to 65° C., preferably between 40° C. to 61° C., thereby denaturizing the inactive accompanying proteins without affecting the L-asparaginase. The precipitated, denatured proteins are then removed, as by centrifuge, the enzyme enriched solution then adjusted to a pH between 4.5 and 5.5 and fractionally precipitated with a 50 percent polyethylene glycol solution, the precipitate then washed with acetone and dried.

3,650,903

METHOD OF PRODUCTION OF FIBRINOLYTIC MATERIAL

Nathan H. Sloane, Germantown, Tenn., assignor to Rand Laboratories, Inc.

Filed July 15, 1969, Ser. No. 841,974
Int. Cl. C07g 7/026
U.S. Cl. 195—66 B 3 Claims

A fibrinolytic material comprising urokinase in highly concentrated form is produced by admixing with human urine an equine adsorbant prepared from an insoluble precipitate which forms in pregnant mare's urine. This insoluble residue extracts and adsorbs urokinase from human urine thereby permitting its recovery, in concentrated form, in a single step. The urokinase is then eluted from the adsorbant, collected, and purified for use in humans or animals to dissolve blood clots and/or prevent their formation, and for use as a blood thinning agent.

3,650,904

PRODUCTION OF CHLORAMPHENICOL, BOTTROMYCIN AND FRADICIN

Toju Hata, 94 Nakameguro, 4-chome; Akihiro Matsumae, 10 Isurumaki, 5-chome; Kimihiko Abe, 50 Kameido-machi, 7-chome; Yoshimoto Sano, 18–17 Nishiogi, Kita, all of Tokyo; Mariko Ohtani, 4055 Mutsuura-cho, Yokohama, and Satoshi Ohmura, 207 Tamagava, Seta-machi, Tokyo, all of Japan

Filed Aug. 18, 1969, Ser. No. 851,100
Int. Cl. C12d 9/00
U.S. Cl. 195—80 1 Claim

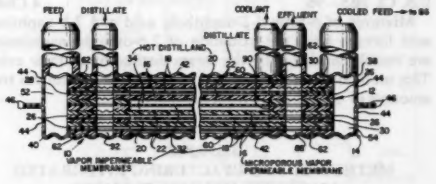
The production of chloramphenicol, bottromycin and fradicin by fermentation utilizing a chloramphenicol-producing microorganism belonging to a new *Kitasatoa* group of the new species of the *Actinoplanaceae*. A live culture of the organism is on deposit with the American Type Culture Collection under the number ATCC 21405.

3,650,905

STACKED MICROPOROUS VAPOR PERMEABLE MEMBRANE DISTILLATION SYSTEM

Franklin A. Rodgers, Brookline, Mass., assignor to Pactide Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 102,811, Dec. 30, 1970, now abandoned, which is a continuation-in-part of application Ser. No. 838,872, July 3, 1969, now abandoned, and a continuation-in-part of 838,769, July 3, 1969, now abandoned. This application Feb. 11, 1971, Ser. No. 114,584
Int. Cl. B01d 3/00, 3/02
U.S. Cl. 203—10 15 Claims



A distillation system incorporating a multiple stage still comprising microporous membranes in which heated and deaerated feed liquid is utilized, in part, as distilland, and in part, as a heating liquid for transferring heat to the distilland within the still to generate a thermal gradient and effect heat transfer required to produce distillate from the distilland. The feed liquid employed for heating is returned to a deaerator heater where it is combined with additional feed liquid to replace the distillate and effluent distilland liquid. Heat is transferred from the effluent and distillate to the additional feed liquid prior to introduction thereof into the deaerator heater.

3,650,906

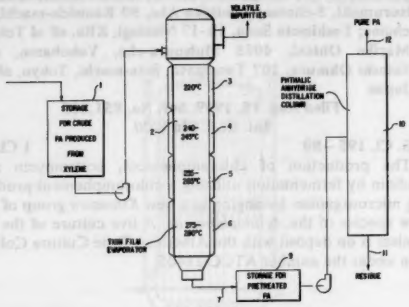
THIN FILM HEATING FOR THE PRELIMINARY PURIFICATION OF CRUDE PHTHALIC ANHYDRIDE

Hubert Gehrken, Weiden; Gerd Helms, Junkersdorf; Gerhard Keunecke, Geyen, and Herbert Krimphove, Cologne, Mungersdorf, all of Germany, assignors to Chemiebau Dr. A. Zieren GmbH & Co. KG, Cologne-Mungersdorf, Germany

Filed Apr. 14, 1969, Ser. No. 816,112
Claims priority, application Germany, Apr. 13, 1968, P 17 68 211.0
Int. Cl. B01d 1/22, 3/00
U.S. Cl. 203—89 17 Claims

In the preliminary purification (prior to distillation) of crude phthalic anhydride produced from xylene, the pretreat-

ment is improved by heating a thin film of molten phthalic anhydride to 200–280° C. during the course of not more than



60 seconds, said film having a thickness of not more than 2 mm.

3,650,907

METHOD OF SEPARATING 2,6-NAPHTHALIC ACID FROM 6-FORMYL-2-NAPHTHOIC ACID

Edward J. McNelis, New Rochelle, N.Y., and Wesley R. Cherry, Prospect Park, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Apr. 23, 1969, Ser. No. 818,815
Int. Cl. B01d *3/38;* **C07c** *67/06, 69/76*
U.S. Cl. 203—96 **4 Claims**

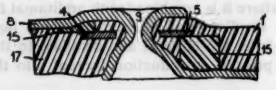
Mixtures of 6-formyl-2-naphthoic acid and 2,6-naphthalic acid formed from the oxidation of 2,6-dimethylnaphthalene are readily separable by the steam distillation of their esters. This method has a further advantage in that it removes trace amounts of color bodies from the aldehyde ester.

3,650,908

METHOD OF MANUFACTURING INTEGRATED MAGNETIC MEMORY ELEMENT

Michel Carbonel, Paris, France, assignor to Thomson-CSF

Filed Nov. 26, 1969, Ser. No. 880,022
Claims priority, application France, Dec. 10, 1968, 177379
Int. Cl. C23b *5/48, 7/00*
U.S. Cl. 204—15 **1 Claim**



In a method of manufacturing integrated magnetic memory elements the steps of: deposition by electrolysis on one face of a substrate made of a metal easily removed by etching agents through a mask, of the magnetic circuit; forming apertures through the substrate, inside the circuit, by etching through a second mask placed over the other face of the substrate; deposition by electrolysis of a further layer of metal on the assembly and in the apertures; depositing the conductor by electrolysis on the two faces of the assembly and in the apertures.

3,650,909

METHOD OF FORMING A POLYMER COATING

Harvey A. Hodes, Entontown, N.J.; James F. Sobieski, St. Paul, Minn., and Michael C. Zerner, Uppsala, Sweden, assignors to The United States of America as represented by the Secretary of the Army

Filed May 27, 1970, Ser. No. 41,113
Int. Cl. B44c *1/04;* **B44d** *1/36*
U.S. Cl. 204—18 PC **3 Claims**

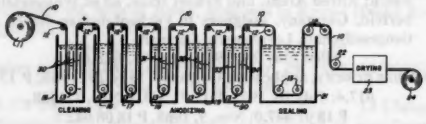
Polymer is formed on metal surfaces such as iron, chromium, cobalt or nickel by first making the metal surface the cathode of a light responsive electrolytic cell. A potential is then applied across the electrodes of the electrolytic cell causing image-wise passage of current therethrough. Polymer may then be deposited in an image-wise fashion by immersing the metal surface in an acid-peroxide-monomer solution.

3,650,910

METHOD FOR ANODIZING ALUMINIZED STEEL STRIP

Griff W. Froman, Lansing, Ill., assignor to Inland Steel Company, Chicago, Ill.

Filed Nov. 19, 1970, Ser. No. 90,892
Int. Cl. C23b *9/02*
U.S. Cl. 204—28 **9 Claims**



Aluminized steel strip is anodized during movement through a succession of anodizing tanks, each housing at least one anodizing stage. The strip is subjected to successively higher current densities in successive anodizing stages. The current density in the first anodizing stage is controlled to prevent pitting, and the increase in current density from one anodizing stage to the next is relatively large.

3,650,911

METALLIZING SUBSTRATES

Kingso Chingtsung Lin, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 6, 1968, Ser. No. 750,476
Int. Cl. C23b *5/60;* **B44d** *1/092*
U.S. Cl. 204—30 **16 Claims**

Substrates particularly thermoplastic resins and polymers, are plated with metals by pre-treatment of the substrate with a metallic coating by contacting said substrate with a basic solution of a metal salt to which is being introduced continuously or portionwise a phosphorus compound wherein the phosphorus has an oxidation number of less than 5. The resulting treated surface is conductive. Such conductive surfaces are readily electroplated by conventional techniques.

3,650,912

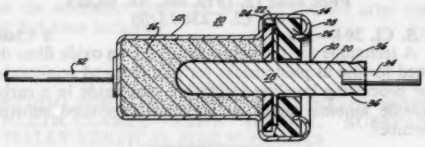
METHOD OF MANUFACTURE OF ELECTROLYTIC CELLS

Edward J. Plehal, Woodland Hills, Calif., assignor to The Bissett-Berman Corporation, Santa Monica, Calif.

Continuation of application Ser. No. 610,140, Jan. 18, 1967, now abandoned. This application Nov. 10, 1969, Ser. No. 871,583
Int. Cl. C23b *3/06*
U.S. Cl. 204—29 **9 Claims**

The invention relates to a method of forming a flanged inner electrode member for use in an electrolytic cell. The

method includes the steps of providing a particular length of soft metallic wire and of cold forming the soft metallic wire to flow some of the wire outwardly to form a flanged electrode member and smoothing the surface of the electrode



member. The method further includes the steps of polishing the surface of the electrode member to remove any irregularities from the surface of the electrode member and of plating the electrode with a layer of gold. The plating may be accomplished either by barrel plating or rack plating.

3,650,913

AN ELECTROLESS PLATING PROCESS EMPLOYING A SPECIALLY PREPARED PALLADIUM-TIN ACTIVATOR SOLUTION

Eugene D. D'Ottavio, Thomaston, Conn., assignor to MacDermid Incorporated, Waterbury, Conn.

No Drawing. Original application June 28, 1967, Ser. No. 654,307. Divided and this application Sept. 8, 1969, Ser. No. 870,770

Int. Cl. C23b *5/60;* **B44d** *1/092*
U.S. Cl. 204—30 **2 Claims**

A method of electroless metal plating of plastic substrates is disclosed involving the use of a one-step acid tin-palladium catalyst activating solution prepared in a particular manner, resulting in improved plating operations and plated substrates.

3,650,914

METAL PLATING PLASTICS

Kingso C. Lin, Newark, Ohio, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Mar. 3, 1970, Ser. No. 15,917

Int. Cl. C23b *17/00, 5/62;* **B44d** *1/092*
U.S. Cl. 204—38 B **17 Claims**

Plastics are metallized by preconditioning the surface thereof by etching and the like, subjecting the preconditioned plastics to an aqueous solution of the organic insoluble product of a process comprising reacting elemental phosphorus an alkali metal or alkaline earth metal alkoxide and oxidizing the resulting product, and thereafter electroless plating the thus-treated plastics.

3,650,915

COPPER ELECTRODEPOSITION ELECTROLYTES AND METHOD

George R. Quimby and Kenneth R. Gray, Shelton, Wash., assignors to International Telephone & Telegraph Corp., New York, N.Y.

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,582

Int. Cl. C23b *5/20, 5/46*
U.S. Cl. 204—52 R **15 Claims**

Improved electrodeposition of copper is achieved by adding a combination of a cation active organic nitrogen compound and a lignosulfonate material to a copper electrodeposition electrolyte.

3,650,916

METHOD FOR THE PRODUCTION OF SULFUR HEXAFLUORIDE

Shunji Nagase, Hajime Baba, Kazuo Kodaira, and Takashi Abe, Nagoya, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed July 17, 1970, Ser. No. 56,001

Claims priority, application Japan, July 18, 1969, 44/57,188

Int. Cl. B01k *3/00*
U.S. Cl. 204—59 **2 Claims**

Carbon monoxide is blown into molten sulfur to produce carbonyl sulfide. The carbonyl sulfide so produced is blown into anhydrous hydrogen fluoride where it is electrolytically fluorinated to produce sulfur hexafluoride.

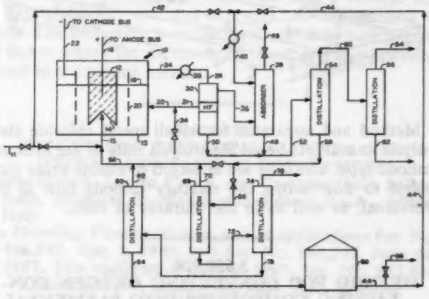
3,650,917

RECOVERY OF PRODUCTS FROM ELECTROCHEMICAL FLUORINATION

Forrest N. Ruehlen, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Aug. 25, 1969, Ser. No. 852,601

Int. Cl. B01k *3/00*
U.S. Cl. 204—59 **13 Claims**



Fluorinated products are recovered from an effluent stream from an electrolytic cell in an electrochemical fluorination process by employing a combination of steps comprising cooling said effluent stream to a temperature sufficient to condense hydrogen fluoride and higher boiling cell products contained in said effluent stream, contacting the noncondensed portion of said cooled effluent stream with an absorbent selected from the group consisting of (a) the fluorinatable feedstock to the electrolytic cell, (b) a high boiling by-product fraction produced as a by-product in the fluorination reaction, and (c) mixtures of said (a) and said (b), and recovering fluorinated products from the resulting rich absorbent and the condensed portion of said cooled effluent stream.

3,650,918

ELECTROCHEMICAL OXIDATION OF OLEFINIC COMPOUNDS

Morris A. Johnson, Paul H. Washecheck, Kang Yang, and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,513

Int. Cl. B01k *1/00;* **C07b** *3/00*
U.S. Cl. 204—80 **10 Claims**

Olefinic compounds are electrolytically oxidized to carbonyl compounds in the presence of an oxidation cata-

lyst consisting of a Group VII metal or compound thereof. The catalyst, which is reduced during the oxidation of the olefinic compounds, is regenerated by a catalyst regeneration agent present in the anolyte. The reduced catalyst regeneration agent is then regenerated electrolytically, thereby preventing any net change in the catalyst or the catalyst regeneration agent.

3,650,919

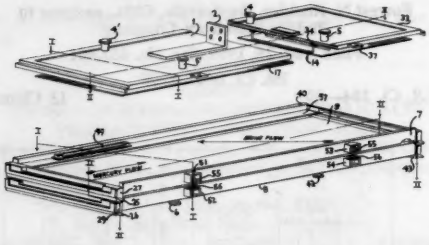
METHOD AND APPARATUS HAVING MULTIPLE-TIERED MERCURY CATHODE ELECTROLYSIS CELLS

Carl W. Raetzsch, John F. Van Hoozer, and Hugh Cunningham, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 410,579, Nov. 12, 1964. This application July 8, 1969, Ser. No. 842,816

Int. Cl. C01d *1/08*; C22d *1/04*

U.S. Cl. 204—99 **18 Claims**



Method and apparatus for alkali metal chloride electrolysis in multiple-tiered electrolysis cells of the mercury cathode type. The cells are arranged to enable brine electrolyte to flow across the mercury cathode flow in the individual, as well as in the plurality of cells.

3,650,920

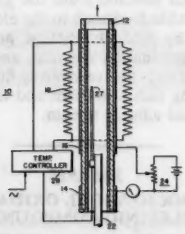
METHOD FOR CONVERTING OXYGEN CONTAINING COMPOUNDS INTO ELEMENTAL CONSTITUENTS

William M. Hickam, Pittsburgh, and Robert E. Witowski, West Mifflin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1969, Ser. No. 876,790

Int. Cl. B01k *3/12*, *1/00*

U.S. Cl. 204—130 **4 Claims**



A method for converting oxygen containing nitrogen compounds and oxygen containing sulfur compounds into elemental constituents including nitrogen, sulfur and oxygen in which an oxygen ion conductive solid electrolyte electrochemical cell electrolytically dissociates and separates the oxygen from the other elemental constituents.

3,650,921

TECHNIQUE FOR THE PREPARATION OF IRON OXIDE FILMS BY CATHODIC SPUTTERING

Frank Groom Peters, Nutley, and William Robert Sinclair and Miles Vincent Sullivan, Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 15, 1970, Ser. No. 46,405

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **5 Claims**

A technique for the preparation of iron oxide films destined for use as photomasks for thin film and semiconductor processing involves sputtering iron oxide in a carbon dioxide ambient upon an electrically isolated substrate member.

3,650,922

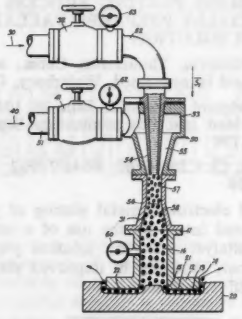
ELECTROCHEMICAL MACHINING OF METALS

Jan Augustin, Podolie, Ctibor Trebichavsky, Nove Mesto nad Vahom, and Jan Zubak, Ostrov, Czechoslovakia, assignors to Vyskumny ustav mechanizacie a automatizacie, Nove Mesto nad Vahom, Czechoslovakia

Filed Aug. 29, 1969, Ser. No. 854,074

Int. Cl. B23p *1/00*

U.S. Cl. 204—143 M **6 Claims**



An electrochemical machining process wherein a current is passed between an electrode and a workpiece and wherein at least two electrolytic fluids are alternated in the space between the electrode and workpiece.

3,650,923

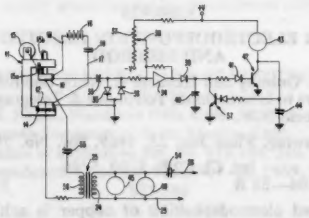
METHOD AND DEVICE FOR DETECTING CONTACT BETWEEN TOOL AND WORKPIECE OF AN ECM APPARATUS

Philip E. Berghausen, Gareth A. Dehner, and John M. Morgan, Jr., Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sept. 19, 1968, Ser. No. 760,783

Int. Cl. B23p *1/00*

U.S. Cl. 204—143 M **13 Claims**



A low AC voltage is applied between a tool and a workpiece of an ECM apparatus. The voltage drop between the

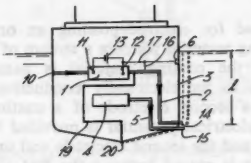
tool and the workpiece decreases when contact occurs between the tool and the workpiece. This change in the voltage drop is sensed to indicate that there is contact. If there is contact, the DC power supply cannot be activated. The device also may be utilized to form a selected size gap between the tool and the workpiece by moving the tool and the workpiece apart the selected distance after contact has been indicated.

3,650,924

METHOD FOR PREVENTING FOULING OF SHIPS, PARTICULARLY SHIPS HAVING SUBSTANTIALLY VERTICAL SIDE SURFACES

Oystein E. Rasmussen, 119 Hosleveien, 1340 Bekkestua, Norway

Filed Apr. 17, 1970, Ser. No. 29,502
Claims priority, application Norway, May 13, 1969, 1,954/69
Int. Cl. B63b *59/00*
U.S. Cl. 204—147 **5 Claims**



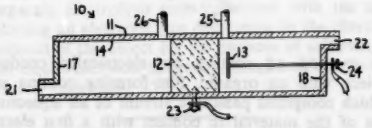
The invention relates to a method and means for the prevention of fouling of ships having substantially vertical side surfaces. Sea water is subjected to electrolysis and the decomposition products are conveyed to and discharged along the side of the ship. Compressed air is simultaneously conducted to the side of the ship and discharged beyond the decomposition products in an amount to form a dense air blanket which holds the decomposition products adjacent the side of the ship.

3,650,925

RECOVERY OF METALS FROM SOLUTION

Gordon A. Carlson, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of applications Ser. No. 806,204, Mar. 11, 1969, and Ser. No. 739,741, June 25, 1968, now Patent No. 3,459,646, which is a continuation-in-part of applications Ser. No. 506,101, Nov. 2, 1965, and Ser. No. 561,999, June 30, 1966. This application June 2, 1969, Ser. No. 829,529
Int. Cl. B01k *3/04*; C01d *1/40*
U.S. Cl. 204—153 **13 Claims**



Disclosed is a method for removing metal ions from a solution containing trace amounts of the metal. The solution is passed through an electrolytic cell having a porous cathode. Metal ions from the solution are electrolytically deposited in the porous cathode as the solution passes through the porous cathode. The metal or metals are then separated from the porous cathode.

3,650,926

RADIOLYTIC TREATMENT OF ORGANIC INDUSTRIAL WASTES IN A PRESSURIZED OXYGEN ATMOSPHERE

Forrest N. Case, Oak Ridge, and David E. Smiley, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Oct. 7, 1969, Ser. No. 864,520
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 **2 Claims**

The present invention relates to a method of increasing the light transparency and reducing the biological oxygen demand of organic-containing waste solutions which comprises the step of exposing such solutions to penetrating ionizing radiation under pressure of an oxygen-containing atmosphere of at least 1000 p.s.i. until the desired degree of optical and ultraviolet transmittancy as well as biological oxygen demand have been reached.

3,650,927

PHOTOPOLYMERIZATION UTILIZING DYE-SENSITIZED SULFONES

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,636
Int. Cl. C08d *1/00*; C08f *1/16*
U.S. Cl. 204—159.24 **6 Claims**

Rapid polymerization of vinyl monomers is accomplished by combining the monomer with a sulfone and a photoreducible dye and exposing the combination to light. The procedure is particularly useful in bulk polymerization where the monomer, sulfone, and dye are combined in a common solvent.

3,650,928

PROCESS FOR PREPARING FLUORINATED OXYGEN-CONTAINING COPOLYMERS

Dario Sianesi, Adolfo Pasetti, and Costante Corti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Continuation-in-part of applications Ser. No. 446,292, Apr. 7, 1965, and Ser. No. 650,257, June 30, 1967. This application Apr. 2, 1969, Ser. No. 812,844
Claims priority, application Italy, Apr. 9, 1964, 7,678/64
Int. Cl. C07c *51/58*; B01j *1/00*; C08d *1/00*
U.S. Cl. 204—159.22 **5 Claims**

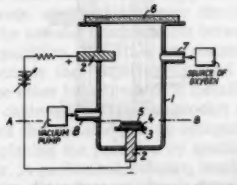
Perfluorinated linear polyethers are prepared by liquid phase photochemical reaction of a mixture of perfluoropropylene and tetrafluoroethylene with oxygen in the presence of ultraviolet radiation.

3,650,929

OXIDIZING METHOD AND APPARATUS

Kurt Lertes, Offenbach am Main, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

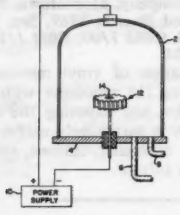
Filed Aug. 14, 1964, Ser. No. 389,535
Claims priority, application Germany, Aug. 16, 1963, L 35,231, L 45,616
Int. Cl. B01k *1/00*; H01k *3/12*
U.S. Cl. 204—164 **1 Claim**



A method and apparatus for oxidizing the surface of a silicon semiconductor body having at least one diffused

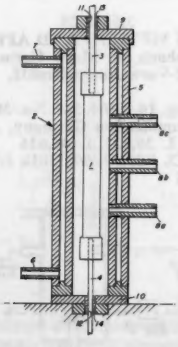
pn-junction. The method comprises the step of treating or bombarding the surface of a semiconductor body with oxygen ions in the region to be oxidized. The oxygen ions are produced in a continuous gas discharge created by apparatus which comprises a closed discharge chamber, two silicon electrodes extending into the chamber and connected to a source which creates a potential difference between them, and oxygen inlet and outlet means attached to the chamber which cause a stream of oxygen to flow through the chamber under a controlled low pressure. The silicon semiconductor body is arranged within the chamber in such a way that the oxygen ions, produced in the discharge, impinge on the surface to be oxidized.

3,650,930
GLOW DISCHARGE MASKING PROCESS
Claude K. Jones, Marblehead, and Stuart W. Martin, Salem, Mass., assignors to General Electric Company
Filed Oct. 27, 1969, Ser. No. 869,815
Int. Cl. C23c *11/14*; B01k *1/00*
U.S. Cl. 204—177 **6 Claims**



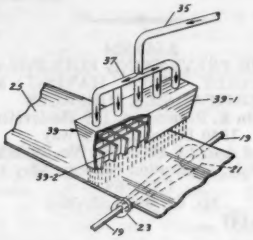
Glow discharge masking process using comminuted material to selectively limit the treatment of a cathode workpiece cavity limiting, to that extent, ionitriding on the cavity walls.

3,650,931
PURIFICATION OF REACTIVE METALS
Thomas A. Henrie, Reno, Nev., assignor to the United States of America as represented by the Secretary of the Interior
Filed June 5, 1969, Ser. No. 830,714
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 R **7 Claims**



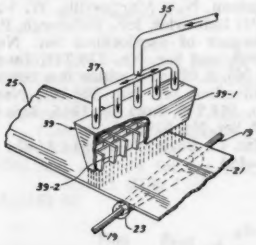
Reactive metals, such as rare-earth metals, are purified by electrotransport in a pulsed direct current electric field.

3,650,932
ELECTRO-FLOW COATING METHOD
Allen H. Turner, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of application Ser. No. 643,127, June 2, 1967. This application Nov. 3, 1969, Ser. No. 873,555
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **1 Claim**



In a method for electrodepositing an organic, film-forming coating material wherein a stream of an aqueous dispersion of the coating material is passed from a first electrode to an electrically conductive workpiece which serves a second electrode of a coating circuit, a difference of electrical potential is provided between the first electrode and the second electrode and unidirectional electric current is passed between the first electrode and second electrode through said stream, the improvement wherein a plurality of streams of the aqueous dispersion are separately passed in contact with the first electrode and converged into a single stream before contacting the workpiece.

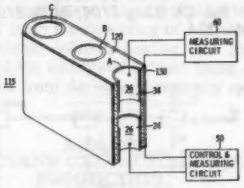
3,650,933
METHOD OF ELECTRO-FLOW COATING
Allen H. Turner, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of application Ser. No. 643,127, June 2, 1967. This application Nov. 3, 1969, Ser. No. 873,554
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **2 Claims**



The method of coating an electrically conductive workpiece with an organic, film-forming coating material which comprises passing a stream of an aqueous dispersion of the material in contact with a first electrode of an electrical circuit, providing a difference of electrical potential between said fist electrode and the workpiece which serves as a second electrode in the same circuit, moving the workpiece through said stream, and passing an electric current between the first electrode and said second electrode through the stream, and wherein the resistivity of said stream is in the range of about 500 to about 1000 ohm-cm. and a high current density is provided at the surface of the workpiece being coated by

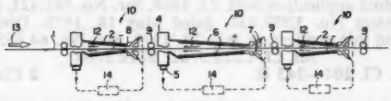
maintaining said difference of electrical potential in the range of about 400 to about 1000, maintaining said first electrode within a distance of less than 10 inches from said second electrode, and causing said stream to pass in contact with said first electrode as a plurality of separate streams which converge before contacting the workpiece.

3,650,934
OXYGEN CONTROL AND MEASURING APPARATUS
William M. Hickam, Pittsburgh, and Robert E. Witkowski, West Mifflin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 14, 1969, Ser. No. 876,791
Int. Cl. G01n *27/26, 27/30*
U.S. Cl. 204—195 **3 Claims**



The invention comprises a combination of a solid electrolyte electrochemical cell as an oxygen ion pumping means and a second solid electrolyte electrochemical cell as an oxygen measuring means, the combination regulating and measuring the oxygen concentration of a fluid respectively.

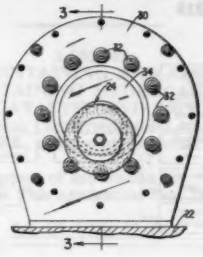
3,650,935
APPARATUS FOR ELECTROLYTIC SURFACE TREATMENT
Bengt Ivar Andersson, Torshalla, Sweden, assignor to AB C. J. Wennbergs Mekaniska Verkstad, Karlstad, Sweden
Filed May 5, 1969, Ser. No. 821,691
Claims priority, application Sweden, May 6, 1968, 6,047/68
Int. Cl. C23b *1/04, 5/58*; B01k *3/00*
U.S. Cl. 204—206 **5 Claims**



A method and an apparatus for carrying out the method of electrochemical surface treatment of metallic objects, the method being with bipolar current conduction in separate electrolysis cells combined with the method employing an electrode gap decreasing in the direction of movement of the object for the purpose of achieving maximum electrochemical efficiency, maximum economy, and operation reliability.

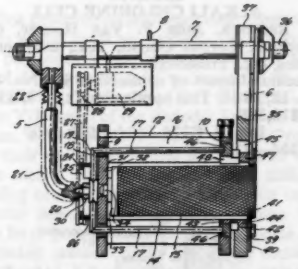
3,650,936
CUTTING MACHINE
Robert G. Towle, 2 Mary Ann Lane, Nanuet, N.Y. 10954
Filed Oct. 22, 1969, Ser. No. 868,448
Int. Cl. C23b *5/68*; B23p *1/00*
U.S. Cl. 204—212 **12 Claims**

A machne for cutting a series of pieces arranged from work in a circle with a wheel having a cutting edge subject to wear and reduction of diameter. The wheel is rotated about its center and the center is orbited in a



circle eccentric to the center of the circle in which the work is arranged. As the wheel wears and its diameter is reduced, the eccentricity of the wheel center and work center is increased.

3,650,937
PLATING BARREL ASSEMBLY
Hans L. Henig, Nuremberg, Germany, assignor to Schering AG, Berlin and Bergkamen, Germany
Filed Feb. 4, 1969, Ser. No. 796,444
Claims priority, application Germany, Aug. 20, 1968, P 17 96 045.1
Int. Cl. C23b *5/78*
U.S. Cl. 204—213 **12 Claims**

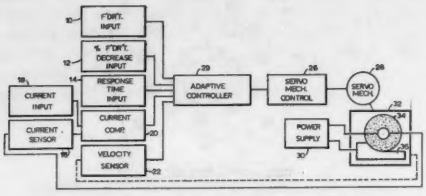


A plating barrel is suspended from hangers one of which has an opening coaxial with a corresponding opening in one end wall of the barrel. A tubular perforated partition is coaxially arranged in the barrel and conformingly received in the openings of the end wall and of the hanger for providing support to the barrel at one axial end. The other axial barrel end is supported by means of four contact rods which axially pass through the other end wall into the annular compartment between the barrel shell and the partition. The rods are connected by a coaxial spider outside the barrel cavity, and the spider is journaled in the other hanger which is metallic. The barrel is turned by a chain trained over a sprocket on the spider. The capacity of the annular plating compartment can be changed by replacing the partition by another one of different diameter. A perforated, tubular, insoluble anode of smaller diameter than the partition is coaxially arranged in the same.

3,650,938
ADAPTIVE CONTROL FOR AN ELG MACHINE

Peter F. Olton and Harry D. Kauffman, Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 24, 1970, Ser. No. 66,331
Int. Cl. C23b 5/78
U.S. Cl. 204—218 9 Claims

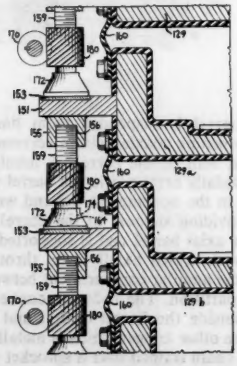


An apparatus for use in an ELG process for automatically changing the relative velocity between a tool and workpiece as a function of current flow therebetween and thereby maintaining an approximately constant ratio of metal removed electrolytically to metal removed by grinding. Input circuits are provided for predetermining a maximum relative velocity between the tool and workpiece, an ideal current magnitude, and a response time for changing the relative velocity. Machining currents at or below the ideal magnitude initiate the maximum relative velocity. However, when the machining current exceeds the ideal magnitude, the apparatus operates to introduce a change in the magnitude of the relative velocity. The time rate of said change is controlled by the predetermined response time.

3,650,939
ALKALI CHLORINE CELL

Carl W. Raetzsch, John F. Van Hoozer, and Hugh Cunningham, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 410,579, Nov. 12, 1964. This application Apr. 4, 1969, Ser. No. 813,588
Int. Cl. C22d 1/04; B01k 3/00
U.S. Cl. 204—219 4 Claims

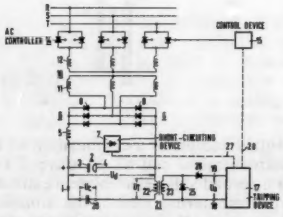


An electrolytic cell comprising a stack of bipolar units is provided. These units each comprise a mercury cathode tray and anodes disposed below the tray so that the anodes oppose the mercury cathode of a lower unit and the mercury cathode opposes the anodes of an upper unit. Means are provided to adjust the relative level of the units. This means comprises a support on one of the units and an adjustable screw on the next adjacent element which rests upon or bears against the support of the first unit. The support-screw assembly is provided with insulation to electrically isolate the units.

3,650,940
DEVICE FOR LIMITING THE POWER SUPPLY UPON SHORT-CIRCUIT BETWEEN WORKPIECE AND TOOL IN ELECTROLYTIC METAL FORMING MACHINE

Nils Bardahl, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 19, 1969, Ser. No. 800,409
Claims priority, application Germany, Feb. 24, 1968, P 16 38 130.9
Int. Cl. B23p 1/04; B01k 3/00
U.S. Cl. 204—224 1 Claim

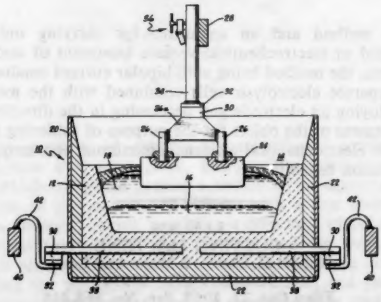


The supply of power to an electrolytic metal forming machine is limited in response to an abrupt voltage change between its electrodes. A control circuit connected to the device controls it to limit the power. The control circuit has a voltage-responsive input member connected in series with a capacitor between the electrodes of the machine and in shunt with the gap between the electrodes.

3,650,941
ELECTROLYTIC REDUCTION CELL

Walter D. Finnegan, Spokane, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Original application Sept. 23, 1968, Ser. No. 761,421, now Patent No. 3,579,432, dated May 18, 1971. Divided and this application July 24, 1970, Ser. No. 64,865
Int. Cl. C22d 3/02; B01k 3/04
U.S. Cl. 204—243 R 2 Claims



A composite electrical conductor adapted to contact an electrode in current transmitting engagement. A ferrous

metal plate is affixed to the free end of a ferrous metal rod adapted to be embedded in the electrode. A soft aluminous plate is roll bonded along one face to the ferrous plate affixed to the rod. An aluminum conductor rod is welded to the aluminous plate roll bonded to the ferrous plate and is adapted to be connected to a source of electric current.

3,650,942

PROCESS FOR THE DEOILING OF OIL-CONTAINING WAX

Alfred Hoppe, Frankfurt am Main, Germany, assignor to Edeleanu Gesellschaft mbH, Frankfurt am Main, Germany

No Drawing. Filed Oct. 7, 1969, Ser. No. 864,545
Claims priority, application Germany, Oct. 9, 1968, P 18 02 051.4
Int. Cl. C10g *43/08*
U.S. Cl. 208—31 8 Claims

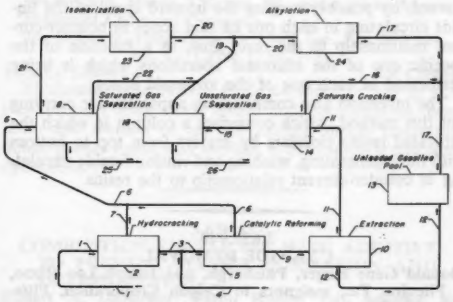
A process for de-oiling a wax containing both oil and solvent obtained from the dewaxing of a hydrocarbon oil by adding additional solvent, heating and refiltering at least a portion of the additional solvent being supplied in the form of vapor from the solvent recovery system.

3,650,943

HIGH OCTANE UNLEADED GASOLINE PRODUCTION

Richard P. Schuller, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 10, 1970, Ser. No. 53,719
Int. Cl. C10g *13/00, 21/00;* C07g *3/54*
U.S. Cl. 208—60 10 Claims



A high octane, unleaded gasoline pool is produced via an integrated refinery operation. The individual processes integrated in combination with each other are hydrocracking, low severity catalytic reforming, saturate cracking and alkylation. Catalytic reforming is effected at low severity conditions to maximize the reaction of naphthene dehydrogenation to produce aromatics which simultaneously inhibiting the dehydrocyclization and cracking of paraffinic hydrocarbons.

3,650,944

REFORMING PROCESS STARTUP

Charles S. McCoy, Orinda, and Willard M. Haunschild, Walnut Creek, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed July 7, 1969, Ser. No. 839,717
Int. Cl. C10g *35/08, 39/00*
U.S. Cl. 208—65 7 Claims

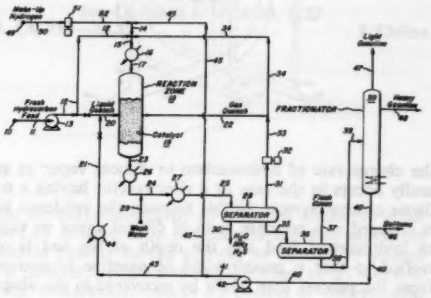
A reforming process involving a plurality of reactors in series containing a platinum group component catalyst is started up by contacting the feed with the catalyst in the presence of an inert gas at a temperature wherein the dehydrogenation reaction predominates, gradually increasing the temperature while adding a small amount of sulfur to the terminal reactor to control the temperature increase across the terminal reactor to below 5° F.

3,650,945

URANIUM-CONTAINING AND ALUMINOSILICATE-CONTAINING HYDROCARBON CONVERSION CATALYST AND PROCESS

Ralph J. Bertolacini, Chesterton, and Louis C. Gutberlet, Crown Point, Ind., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 749,838, Aug. 2, 1968. This application Jan. 28, 1969, Ser. No. 794,731
Int. Cl. C10g *13/04*
U.S. Cl. 208—111 19 Claims



The catalyst comprises a hydrogenation component and a cocatalytic acidic cracking support. The hydrogenation component comprises a member selected from the group consisting of (1) uranium and a Group VI–B metal of the Periodic Table of Elements; (2) a Group VI–B metal and a Group VIII metal of the Periodic Table of Elements; (3) uranium, a Group VI–B metal, and a Group VIII metal; (4) their oxides; (5) their sulfides; and (6) mixtures of the metals, their oxides, and their sulfides. The acidic cracking support comprises a large-pore crystalline aluminosilicate material and a silica-alumina cracking catalyst, the large-pore crystalline aluminosilicate material being a member selected from the group consisting of uranium-exchanged X-type aluminosilicate material, uranium-exchanged Y-type aluminosilicate material, uranium-exchanged L-type aluminosilicate material, and ultrastable, large-pore crystalline aluminosilicate material. The catalyst is characterized by the presence of at least some uranium in its composite.

The process comprises contacting petroleum hydrocarbons with the catalyst of the invention under hydrocarbon conversion conditions.

3,650,946

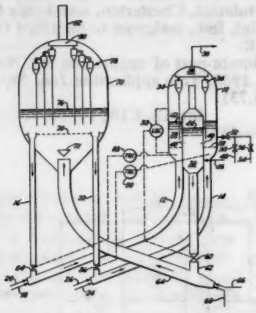
FLUID CATALYTIC CRACKING IN A DENSE CATALYST BED

Marion P. Mourning, Media, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1969, Ser. No. 862,623
Int. Cl. B01j *9/00;* C10g *11/02, 11/18*
U.S. Cl. 208—120 7 Claims

A hydrocarbon feed is cracked in the presence of a fluid zeolite catalyst or a catalyst of comparable activity and/or selectivity which produces a transient maximum

gasoline yield at a residence time of 5 seconds or less and in the presence of a diluent vapor or vapors which lower the partial pressure of the hydrocarbon feed and increase gasoline selectivity. Residence time is established by regulating the depth of a dense catalyst bed relative to the position of charging the hydrocarbon feed so that residence time control does not require adjustment of



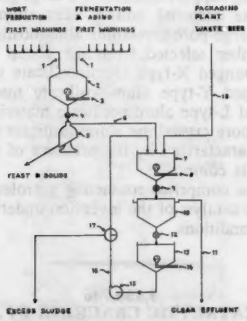
the charge rate of hydrocarbon or diluent vapor as generally occurs in the case of a riser reactor having a non-dense catalyst system. In this manner, the residence time is changed at a constant ratio of diluent vapor or vapors to hydrocarbon feed and the depth of the bed is controlled so that a greater yield of gasoline is recovered from the process than could be recovered in the absence of the diluent vapor.

3,650,947

BIOLOGICAL PROCESS FOR PURIFICATION OF BREWERY EFFLUENT

Erik Krabbe, 12—56 117th St., College Point, N.Y. 11356

Filed Sept. 28, 1970, Ser. No. 75,958
Int. Cl. C02c *5/10*
U.S. Cl. 210—15 **8 Claims**



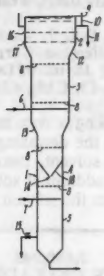
A two-stage biological process for purification of brewery effluent is provided wherein fermentation of sugars by means of aeration with yeast precedes treatment with activated sludge, thereby enhancing fluocculation and separation of biota from the purified effluent. The yeast may be recovered.

3,650,948

METHOD AND APPARATUS FOR THE CONTINUOUS REGENERATION OF ION EXCHANGE RESINS

Jean Clamart Burriat and Philippe du Fort, Louveciennes, France, assignors to Degremont, Societe Generale d'Epuration et d'Assainissement, Rueil, France

Filed Nov. 3, 1969, Ser. No. 873,369
Claims priority, application France, Nov. 20, 1968, 174,498
Int. Cl. B01d *15/06*; B01j *1/06*
U.S. Cl. 210—33 **6 Claims**



This invention provides a method of regenerating ion exchange resins in a fluid bed, which consists in loosening, actually regenerating and thereafter rinsing the regenerated ion exchange resins as a continuous process in a same and single enclosure, in superposed successive zones thereof, by possibly varying the upward speed of the liquids circulating in each one of said zones in counter-current relationship to the resin flow, as a function of the specific one of the aforesaid operations which is being performed in each one of the aforesaid zones.

The invention also comprises an apparatus for carrying out this method, which comprises a column in which the saturated resins circulate by gravity from top to bottom with the regenerating, washing and rinsing liquids circulating in counter-current relationship to the resins.

3,650,949

CYANIDE REMOVAL

Donald Gene Hager, Pittsburgh, and Joseph Leo Rizzo, Pitcairn, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed Dec. 24, 1969, Ser. No. 888,026
Int. Cl. B01d *15/00, 23/14*
U.S. Cl. 210—36 **5 Claims**

Method of removing cyanide from water are disclosed in which copper salts and oxygen are added to the water upstream of a bed of activated carbon. The copper and cyanide form a complex of uncertain composition. The copper complexed cyanide thus formed is adsorbed on the activated carbon, which catalyzes the oxidation of the cyanide to carbon dioxide and nitrogen.

3,650,950

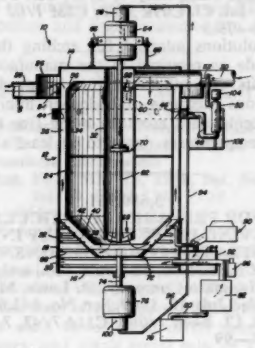
MATERIAL SHEARING MIXER AND AERATOR

Robert W. White, 409 S. Union Ave., P.O. Box 74, Salem, Ohio 44460

Filed Aug. 20, 1969, Ser. No. 851,702
Int. Cl. B01d *43/00*
U.S. Cl. 210—60 **24 Claims**

Fluent materials including sewage and industrial discharges such as exhaust gases, smoke and slurries are treated to remove noxious odors, to decompose and oxidize undesirable compounds and to condition the waste material for easier handling or subsequent treatment. The

fluent material is subjected to shearing stresses simultaneously with the injection of an oxidizing agent such as



ozone to enhance biochemical and chemical treatment of the material as well as to physically treat the material.

3,650,951

OIL WELL DRILLING AND TREATING FLUIDS

Byron E. Marsh, Western Springs, and Roy J. Betty and Frederick S. Marsh, Chicago, Ill., assignors to Armour Industrial Chemical Company

No Drawing. Filed June 30, 1967, Ser. No. 650,208
Int. Cl. C10m *1/32, 1/34*
U.S. Cl. 252—8.5 6 Claims

Thickened hydrocarbon fluids obtained by the in situ reaction of a long chain amine and isocyanate to form urea, and method of use for drilling fluids, fracturing fluids, packer fluids, and the like in petroleum production operations.

3,650,952

COMBUSTION ENGINE OIL WITH ADDITIVE TO PREVENT SLUDGE FORMATION AND DETERIORATION

Robert A. Gerlicher, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

No Drawing. Filed Aug. 5, 1970, Ser. No. 61,427
Int. Cl. C10m *1/32, 1/34*
U.S. Cl. 252—33.6 5 Claims

A method for preventing sludge formation and deterioration of a lubricating oil composition for internal combustion engines comprising formulating the lubricating oil composition to contain one part by weight of an N-nitroso aryl hydroxyl amine compound or metal salt thereof per 100–10,000 parts by weight of the oil and a concentrate for use in adding to crank case oils.

3,650,953

LUBRICATING OIL COMPOSITION CONTAINING A PHOSPHONAMIDE

Thomas J. Clough, Webster Grove, Mo., assignor to Atlantic Richfield Company

No Drawing. Filed Apr. 11, 1967, Ser. No. 629,929
Int. Cl. C10m *1/20, 1/36, 1/44*
U.S. Cl. 252—49.9 8 Claims

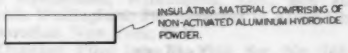
A phosphorus halide (e.g. PCl_3) is present during the Friedel-Crafts polymerization in a monochloroalkane solvent (e.g. ethylchloride) of an alpha-monoalkene, resulting in the in situ formation of a phosphorylated polymer. Further reaction of the polymer with a polyamine converts phosphoryl groups to phosphonamide groups, yielding a product which is useful as a lube oil detergent.

3,650,954

INSULATING PAPER OF GOOD THERMAL CONDUCTIVITY

Toshitaka Yasuda, Suita, Osaka Prefecture, Shiro Katayama, Kita-Katsuragi-gun, and Yutaka Suzuki, Shizuoka, Japan, assignors to Tatsuta Electric Wire & Cable Co., Ltd., Osaka, and Tomoegawa Paper Manufacturing Co., Ltd., Tokyo, Japan, fractional part interest to each

Continuation-in-part of application Ser. No. 371,903, June 2, 1964. This application June 12, 1968, Ser. No. 736,347
Claims priority, application Japan, June 3, 1963, 38/29,101
Int. Cl. H01b *3/10, 3/20, 3/52*
U.S. Cl. 252—63.2 3 Claims



The thermal conductivity of electrical insulation is improved by incorporating therein non-activated aluminum hydroxide powder having a purity of at least 99 percent and a maximum Na_2O and Fe_2O_3 content of 0.7 and 0.05 percent, respectively, and/or by coating or impregnating same with an admixture of resin, thermally conductive material and surface active substance.

3,650,955

GASEOUS MIXTURE FOR USE IN ELECTRICAL APPARATUS

Jean P. Manion, Milwaukee, John A. Philosophos, Brookfield, and Marquis B. Robinson, Milwaukee, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Continuation of application Ser. No. 600,564, Dec. 9, 1966. This application May 27, 1970, Ser. No. 41,705
Int. Cl. H01b *3/24*
U.S. Cl. 252—66 1 Claim

A gaseous mixture for arc extinguishing and insulating in circuit breakers comprising a first gas such as perfluorocyclobutane (cC_4F_8) having high dielectric strength but a relatively slow dielectric recovery rate and a second gas such as dichlorodifluoromethane (CCl_2F_2) which has a rapid initial dielectric recovery and only a moderately high ultimate dielectric strength in comparison to the first gas.

3,650,956

HEAVY-DUTY AEROSOL CLEANER

David L. Strand, Maplewood, and Roger L. Abler, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed May 28, 1969, Ser. No. 828,701
Int. Cl. C11d *17/00*
U.S. Cl. 252—90 5 Claims

A heavy-duty foaming aerosol abrasive cleaner composition particularly adapted for cleaning hard surface floors without detrimental effect on floors or floor finishes. The cleaner comprises a thixotropic suspension of bentonite, abrasive particles, reducing agent for corrosion

prevention, an effective amount of at least one higher fatty acid alkanolamide to provide a visible foam, and sufficient water to provide the desired viscosity.

3,650,957
ETCHANT FOR CUPREOUS METALS
Charles R. Shipley, Jr., and Michael Gulla, Newton, Mass., assignors to Shipley Company, Inc., Newton, Mass.
No Drawing. Filed July 24, 1970, Ser. No. 58,200
Int. Cl. C09k 3/00; C23f 1/00
U.S. Cl. 252—79.1 23 Claims

This invention is for a solution for etching cupreous metals comprising a source of cupric ions, at least one complexing agent for cupric ions which agent is capable of forming a solution soluble copper (II) complex at solution pH, a source of bromide or chloride ions and a solution soluble molybdenum, tungsten or vanadium compound. Cupric etching solutions have been found to attack tin and tin-lead solder plate such as that used in the fabrication of printed circuit boards. The addition of a molybdenum, tungsten, or vanadium compound to the etching solution retards or eliminates such attack.

3,650,958
ETCHANT FOR CUPREOUS METALS
Charles R. Shipley, Jr., Newton, Mass., assignor to Shipley Company, Inc., Newton, Mass.
No Drawing. Filed July 24, 1970, Ser. No. 58,170
Int. Cl. C09k 3/00; C23f 1/00
U.S. Cl. 252—79.1 20 Claims

This invention is for a solution for etching cupreous metals comprising a source of cupric ions, at least one non-fuming complexing agent for cupric ions which is capable of forming a solution of soluble copper (II) complex at solution pH, and preferably a source of bromide or chloride ions. The invention is an improvement over prior art ammoniacal etchants inasmuch as it is capable of use over a wide range of pH and does not yield excessive ammonia fumes which would require expensive exhaust equipment and frequent replenishment of the etchant solution. In a preferred embodiment of this invention an etchant is provided which has a pH varying between 6 and 8 and more preferably, a pH of about 7 to 7.5.

3,650,959
ETCHANT FOR CUPREOUS METALS
Charles R. Shipley, Jr., Newton, and Oleh B. Dutkewych, Medfield, Mass., assignors to Shipley Company, Inc., Newton, Mass.
No Drawing. Filed July 24, 1970, Ser. No. 58,160
Int. Cl. C09k 3/00; C23f 1/00
U.S. Cl. 252—79.1 22 Claims

This invention is for a solution capable of continuous etching of cupreous metals without a requirement for substantial regeneration or replenishment, which etching solution comprises a source of cupric ions, at least one non-fuming complexing agent for cupric ions which is capable of forming a solution soluble copper (II) complex at solution pH, preferably a source of bromide or chloride ions and a source of nitrate ions. In a preferred embodiment, the etching solution also contains a solution soluble molybdenum, tungsten or vanadium compound. The invention is an improvement over prior art ammoniacal etchants inasmuch as it is capable of use over a wide range of pH, does not yield excessive ammonia fumes which would require expensive exhaust equipment and with frequent removal of copper precipitate as it forms, is capable of continuous use without frequent regeneration or substantial replenishment.

3,650,960
ETCHING SOLUTIONS
Cyrus M. Strauss, Philadelphia, Pa., and John M. Bauer, San Jose, Calif., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed May 6, 1969, Ser. No. 822,288
Int. Cl. C09k 3/00; C23f 1/02
U.S. Cl. 252—79.3 4 Claims

Etching solutions adapted for etching thin layers of silicon dioxide as required in the manufacture of integrated circuits and other semi-conductor devices, comprising aqueous mixtures of hydrogen fluoride and ammonium fluoride, said mixtures being free from crystallization at temperatures down to at least about +5° F.

3,650,961
PROCESS FOR PREPARING PARTICULATE PRODUCTS HAVING PREFERENTIALLY INTERNALLY CONCENTRATED CORE COMPONENTS
Robert B. Hudson, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed July 18, 1969, Ser. No. 842,890
Int. Cl. B44d 1/095; C11d 7/42, 7/56
U.S. Cl. 252—99 6 Claims

Granular particles comprising a partially hydrated inorganic salt and a core component, the core component being preferentially internally concentrated in the particles, are prepared by spraying an aqueous medium containing the core component onto a fluidized bed of hydrateable inorganic salt. Such particles wherein the core component is, for example, a chlorocyanurate are useful ingredients of detergent compositions wherein they exhibit excellent chemical and physical stability.

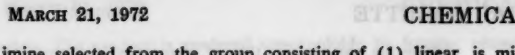
3,650,962
WASHING, BLEACHING AND CLEANSING AGENTS CONTAINING POLY-(N-ACETIC ACID)-ETHYLENEIMINES
Achim Werdehausen, Monheim, Arnold Heins, Hilden, and Manfred Dohr, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany
No Drawing. Filed Dec. 1, 1969, Ser. No. 881,264
Claims priority, application Germany, Dec. 21, 1968, P 18 16 348.9
Int. Cl. C11d 7/54
U.S. Cl. 252—102 3 Claims

A washing, bleaching and cleansing agent having a content of from 50% to 99.9%, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1% to 50%, by weight, of a polyethyleneimine selected from the group consisting of (1) branched poly-(N-acetic acid)-polyethyleneimines having an average molecular weight of from 2,000 to 200,000 wherein from about 50% to 100% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated and (2) their alkali metal, ammonium and organic ammonium salts.

3,650,963
WASHING, BLEACHING AND CLEANSING AGENTS CONTAINING POLY-(N-ACETIC ACID)-ETHYLENEIMINES
Achim Werdehausen, Monheim, and Manfred Dohr, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany
No Drawing. Filed Dec. 1, 1969, Ser. No. 881,301
Claims priority, application Germany, Dec. 21, 1968, P 18 16 280.6
Int. Cl. C11d 7/54
U.S. Cl. 252—102 4 Claims

A washing, bleaching and cleansing agent having a content of from 50% to 99.9%, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1% to 50%, by weight, of a polyethylene-

imine selected from the group consisting of (1) linear poly-(N-acetic acid)-polyethyleneimines of the formula



wherein *n* is an integer from 3 to 50 and (2) their alkali metal, ammonium and organic ammonium salts.

3,650,964
LOW FOAM ANIONIC ACID SANITIZER COMPOSITIONS
Ronald M. Sedliar, Trenton, Donald F. Garvin, Berkley, and Otto T. Aepli, Southgate, Mich., assignors to BASF Wyandotte Corporation
No Drawing. Filed May 13, 1968, Ser. No. 728,766
Int. Cl. C11d *3/48, 7/08*
U.S. Cl. 252—106 **14 Claims**

Low foam sanitizer compositions are prepared from anionic surfactants or blends thereof in an acid media. The anionic surfactants used in the present invention are those having low foaming characteristics. These anionics are members of the class of sulfonated oleic acids, derivatives of sulfonated oleic acids, alkali metal salts of sulfosuccinic acid esters, and alkali metal salts of alkyl sulfates.

3,650,965
LOW FOAM DETERGENT COMPOSITIONS
Abraham Cantor, Elkins Park, Pa., and Murray W. Winicov, Flushing, N.Y., assignors to West Laboratories, Inc., Long Island, N.Y.
No Drawing. Filed July 25, 1968, Ser. No. 747,427
Int. Cl. C11d *3/48, 7/08*
U.S. Cl. 252—106 **12 Claims**

Low foam detergent composition consisting essentially of:

(a) a nonionic surface active component having a cloud point above 45° C.,
(b) an amount of the order of 5 to 100% by weight of component "a," of a nionionic surface active component having a cloud point below 35° C.,
(c) an amount of the order of 1 to 50% by weight of component "a," of a component selected from the group consisting of aliphatic monocarboxylic acids and aliphatic alcohols wherein the aliphatic radical contains 8 to 18 carbon atoms, and
(d) when said composition contains aliphatic monocarboxylic acid as component "c," an amount of the order of 1 to 20 times the weight of component "a" of a mineral acid, preferably phosphoric acid.

When a combined detergent-sanitizer action is desired said composition should also contain an iodine source providing an amount of available iodine of the order of 5 to 50% of the combined weight of components "a" and "b."

3,650,966
IODINE DETERGENT COMPOSITION
Richard Leo Bakka, Rosemount, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.
No Drawing. Filed Aug. 20, 1969, Ser. No. 851,725
Int. Cl. C11d *3/48*
U.S. Cl. 252—106 **1 Claim**

Germicidal-detergent compositions having low foaming properties containing iodine and, as a carrier therefor, triethanolamine octyl sulfate.

3,650,967
ENZYMATIC GRANULES
Wade A. Johnson, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Sept. 15, 1969, Ser. No. 858,106
Int. Cl. C11d *3/12, 1/86;* C12k *1/08*
U.S. Cl. 252—135 **20 Claims**

The malodor of granules formed from enzyme and a powdered hydratable mineral salt in the presence of water is minimized and substantially removed by incorporating into the granules an inorganic colloidal mineral material. Examples of such materials include colloidal silica, colloidal magnesium silicate and colloidal alumino-silicates.

3,650,968
FISHERMAN'S SOAP
Paul Hoffman, 1001 SW. 16th Ave, Gainesville, Fla. 32601, and John D. Hodge, Jr., 1505 Carr St., Palatka, Fla. 32077
No Drawing. Filed Apr. 30, 1968, Ser. No. 725,499
Int. Cl. C11d *7/08;* C23g *1/02*
U.S. Cl. 252—142 **14 Claims**

A cleaning composition for removing odors originating with fish, fish residue, fish slime and the like comprising a source of citric acid and a compatible detergent. The source of citric acid is preferably citrus fruits and the like, and the compatible detergent is preferably of the non-ionic type.

3,650,969
COMPOSITIONS FOR REMOVAL OF FINISH COATINGS
Gotlibs Baltakmens, Wilmington, Del., and John P. Tourish, Wallingford, Pa., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed July 29, 1968, Ser. No. 748,207
Int. Cl. C11d *7/50*
U.S. Cl. 252—143 **11 Claims**

Improved compositions for the removal of finish coatings, such as paint coatings, from substrates comprise a dichloroalkane containing 1 to 2 carbon atoms, such as methylene chloride, an aliphatic monohydric alcohol containing 1 to 3 carbon atoms, such as methanol, hydrogen fluoride, water and preferably iodine.

3,650,970
CALCIUM SULPHATE SCALE INHIBITING COMPOSITION OF SALT OF ESTER POLYMER OF STYRENE-MALEIC ANHYDRIDE COPOLYMER
Richard J. Pratt, Flossmoor, and David W. Young, Homewood, Ill., assignors to Atlantic Richfield Company
No Drawing. Filed Jan. 8, 1969, Ser. No. 789,923
Int. Cl. C02b *5/06*
U.S. Cl. 252—181 **5 Claims**

A method is disclosed for inhibiting calcium sulphate scale formations in systems containing water which contains calcium sulphate. The method comprises providing small amounts of a gypsum scale inhibitor which is an alkali metal or ammonium salt of an ester polymer formed by esterifying styrene-maleic anhydride copolymers with capped polyethylene glycols. The amount of the inhibitor provided can vary with the amount of calcium sulphate in the water but even very small amounts of the inhibitor reduce scale formations. The ester polymer salt can be formed in situ.

3,650,971
COMPOSITION FOR PLASTICIZING RUBBER
Richard S. Tobey, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed June 26, 1970, Ser. No. 50,356
Int. Cl. C09k *3/00*
U.S. Cl. 252—182 **8 Claims**

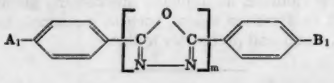
A composition useful for plasticizing or peptizing rubber; it is in the form of easy-to-use pourable solid particles, and it is substantially free of unpleasant mercaptan odor. The composition is comprised of particles of hydrated silica or calcium silicate of certain particle size and surface area to which is attached a specified amount of xylyl mercaptan; and preferably the composition also contains uniformly dispersed iron phthalocyanine and clay, plus a suitable liquid such as kerosene.

3,650,972
LIQUID ACYL SULFONYL PEROXIDE-SOLVENT COMPOSITIONS
Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Filed Nov. 7, 1969, Ser. No. 874,990
Int. Cl. C07c 73/00; D06l 3/02
U.S. Cl. 252—186 11 Claims

Storage stable compositions, liquid below —10° C., are formed by liquid acyl sulfonyl peroxides and liquid polar or polarizable solvents. Example: A composition of 70 weight percent of acetyl sec-heptyl sulfonyl peroxide and 30 weight percent of dimethyl phthalate, is liquid at —80° C., shock stable, and has essentially no loss in assay after 4 weeks storage at 0° C.

3,650,973
METHOD FOR SCINTILLATION COUNTING
Erwin Maeder, Aesch, Basel-Land, Rudolf Anliker, Binningen, Karl Schmid, Reinach, Basel-Land, and Adolf Emil Siegrist, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Continuation of application Ser. No. 577,168, Sept. 6, 1966. This application July 31, 1969, Ser. No. 850,312
Claims priority, application Switzerland, Sept. 15, 1965, 12,815/65
Int. Cl. C09k 1/02
U.S. Cl. 252—301.2 6 Claims

A method is provided for counting atomic disintegrations of radioactive material which is accompanied by emission of β-rays, wherein the material is dispersed in a scintillation liquid which contains an oxdiazole compound of the formula



wherein A_1 is a branched chain alkyl, B_1 is hydrogen, phenyl, lower alkyl, or lower alkoxy, and m is 1 or 2. The counts per minute emitted by the material dispersed in the scintillation liquid are measured with a suitable instrument such as a liquid scintillation spectrometer.

3,650,974
ALKALINE EARTH HALOSILICATE PHOSPHORS
Harold Francis Ward, London, England, assignor to Thorn Electrical Industries Limited, London, England
No Drawing. Filed May 13, 1969, Ser. No. 824,260
Int. Cl. C09k 1/54
U.S. Cl. 252—301.4 F 3 Claims

A phosphor for use in fluorescent lamps comprising an alakilne earth yttrium or lanthanum halosilicate activated by activating metal ions in the trivalent state and/or activating metal ions in the divalent state, e.g., by trivalent tin, antimony, terbium, cerium or europium ions.

3,650,975
RARE EARTH OXIDE PHOSPHORS CONTAINING ALKALI METAL SILICATES AND GERMANATES
Ramon L. Yale, Ulster, Pa., assignor to Sylvania Electric Products Inc.
No Drawing. Filed Oct. 31, 1969, Ser. No. 873,067
Int. Cl. C09k 1/10, 1/54
U.S. Cl. 252—301.4 F 9 Claims

A new phosphor composition having increased brightness is disclosed that consists essentially of a rare earth oxide host material having a europium activator and specific amounts of an ion selected from the group consisting of silicate, germanate and mixtures thereof and specific amounts of alkali metal ions selected from the group consisting of lithium, sodium, and mixtures thereof. A process for producing the new phosphors and for controlling the particle size thereof, comprises incorporating an alkali metal compound selected from the group consisting of lithium silicate, lithium germanate and mixtures thereof with the appropriate rare earth oxalate and subjecting the mixture to a two step heating process.

3,650,976
MIXED ALKALINE EARTH SULFATE PHOSPHOR COMPOSITIONS
George W. Luckey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Oct. 21, 1969, Ser. No. 868,224
Int. Cl. C09k 1/22
U.S. Cl. 252—301.4 S 14 Claims

Novel phosphors comprising lanthanide-activated plural mixed alkaline earth sulfates such as europium-activated strontium barium sulfate, are prepared by the coprecipitation of the lanthanide ion and said plural alkaline earth ions in dilute solution. The phosphors show high efficiency of fluorescence when excited by X-rays and are particularly useful in intensifying screens in combination with radiographic image recording elements.

3,650,977
METHOD OF PREPARING SILICA SOL AND PRODUCT THEREOF
John S. Stephen Bobb, Springfield, Pa., assignor to Philadelphia Quartz Company, Philadelphia, Pa.
No Drawing. Continuation-in-part of application Ser. No. 548,841, May 10, 1966. This application Mar. 27, 1969, Ser. No. 811,219
Int. Cl. B01j 13/00; C01b 33/14, 33/18
U.S. Cl. 252—313 S 16 Claims

A method of forming a silica sol, including adding silicon metal to an aqueous solution containing an inorganic alkali metal compound and having a pH in excess of about 11, such as sodium hydroxide, potassium hydroxide, lithium hydroxide, sodium silicate, sodium metasilicate, etc., while maintaining the temperature between about 50 and 100° C. and thereafter maintaining these materials in contact at the above temperatures for a period sufficient to produce a predetermined silica-to-alkali metal oxide ratio or a predetermined pH is attained. If the temperature reaches 100° during either of the treating steps, the product produced loses some of its hydrophilic character to the point of becoming a hydrophobic, low viscosity silica sol, whereas at lower temperatures, hydrophilic, high viscosity silica sols are produced. In addition, by maintaining the temperature in the critical range of 90 to 95° C., substantial increases in the efficiency of conversion of silicon to silica are obtained. The silica sol products of the invention are characterized by a viscosity below about 200 cp. for hydrophobic sols and a viscosity substantially above 300 cp. for hydrophilic sols at silica contents of about 50% and both are characterized by formation of a coacervate or precipitate which does not harden or redissolve when conventional gelling agents are added thereto.

3,650,978
VINYL-MALEIC ACID THIOESTER OR THIOETHERESTER POLYMERS OR SALTS THEREOF AS EMULSIFYING AGENTS
Robert R. Chambers, Homewood, Henry V. Isaacson, Oak Forest, and David W. Young, Homewood, Ill., assignors to Atlantic Richfield Company
No Drawing. Original application Jan. 4, 1967, Ser. No. 607,150, now Patent No. 3,472,772, dated Oct. 14, 1969. Divided and this application Apr. 25, 1969, Ser. No. 840,884
Int. Cl. B01f 17/36
U.S. Cl. 252—356 12 Claims

A vinyl monomer (e.g., styrene)-maleic anhydride polymer is esterified with a thioalcohol or a hydroxythio-

ether. The product is rendered water-soluble by formation of amine, ammonium or alkali metal salt thereof, and the water-soluble salt is used as an emulsifying aid in oil-water emulsions, e.g., mineral oil-based cutting fluids.

3,650,979

METHYL-POLYSILOXANE-CONTAINING DEFOAMING AGENTS AND PREPARATION THEREOF

Hans-Horst Steinbach, Schildgen, Werner Theuer, Opladen-Luetzenkirchen, and Karl Schnurrbusch, Leverkusen-Steinbuechel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 16, 1968, Ser. No. 729,546

Claims priority, application Germany, May 26, 1967, F 52,507

Int. Cl. B01d *17/00*

U.S. Cl. 252—358 3 Claims

A stable defoaming agent which is very effective in aqueous systems is prepared according to the invention by emulsifying, in 100 to 10,000 parts by weight of water, 100 parts by weight of an α,ω-bis-(trimethylsiloxy)-polydimethyl-siloxane having a viscosity between 500 and 5000 centistokes at 20° C., 1 to 15 parts by weight of finely divided silica and 20 to 40 parts by weight of an emulsifier consisting of a polyglycol ether or a fatty acid ester thereof or of an alkyl- or aryl-sulphate or -sulphonate, and admixing the emulsion so obtained with 100 to 500 parts by weight of a fatty acid ester of hydroxyethane-sulphonic acid or an alkali metal salt thereof.

3,650,980

RETARDING WATER EVAPORATION WITH SURFACE FILMS OF OXO ALCOHOLS CONTAINING ORTHOSILICIC ACID ESTER

Herbert Göthel, Oberhausen-Holten, Hans Feichtinger, Dinslaken, and Hans Tummes, Oberhausen-Strakrade-Nord, Germany, assignors to Ruhrchemie Aktiengesellschaft

Filed Oct. 22, 1969, Ser. No. 868,535

Claims priority, application Germany, Nov. 20, 1968, P 18 10 018.0

Int. Cl. B01j *1/18*

U.S. Cl. 252—384 5 Claims

A film forming composition for application to water surfaces to retard evaporation loses comprises a higher alkyl alcohol and up to three weight percent of an orthosilicic acid ester of an oxyalkylated alcohol.

3,650,981

PROCESS FOR STABILIZATION OF COMPOSITION COMPRISING CHLOROFLUOROALKANE AND AQUEOUS SOLUTION OF LOWER ALCOHOL

Ryuichiro Inouye, Manaka Nishikawa, and Akimi Akano, Shimizu-shi, Japan, assignors to Mitsui Fluorochemicals Company, Ltd., Chiyoda-ku, Tokyo, Japan

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,540

Claims priority, application Japan, Sept. 2, 1968, 43/62,658

Int. Cl. C09k *3/00*

U.S. Cl. 252—389 6 Claims

Process for stabilizing an aerosol composition comprising a chlorofluoroalkane and an aqueous solution of a lower alcohol, which comprises adding to said composition (a) at least 0.1% by weight, based on said chlorofluoroalkane, of nitromethane and (b) at least 0.05% by weight, based on said chlorofluoroalkane, of a compound selected from the group consisting of alkali metal phosphates of polyoxyethylene alkyl ethers, phosphoric acid amine salts of polyoxyethylene alkyl ethers, alkali metal phosphates of polyoxyethylene alkylphenol ethers, phosphoric acid amine salts of polyoxyethylene alkylphenol ethers, and alkali metal alkylsulfates.

3,650,982

PROCESS FOR INHIBITING CORROSION OF TIN-PLATED STEEL AEROSOL CANS

Lloyd T. Flanner, Florham Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 4, 1969, Ser. No. 796,577

Int. Cl. C09k *3/00*

U.S. Cl. 252—394 6 Claims

Propellant compositions, inhibited against corrosion of tin-plated steel aerosol cans containing water-based concentrates, consisting essentially of at least one liquefied saturated hydrocarbon having 3 or 4 carbon atoms and about 0.01 to 2% by weight based on the hydrocarbon of nitromethane or 2-nitropropane.

3,650,983

ALKALINE WASH REACTIVATION OF PALLADIUM CATALYSTS USED IN VINYL ACETATE SYNTHESIS

Franklyn D. Miller, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 615,067, Feb. 10, 1967. This application Dec. 23, 1969, Ser. No. 887,736

Int. Cl. B01j *11/14, 11/10*

U.S. Cl. 252—412 7 Claims

A method for the reactivation of a palladium catalyst having a reduced activity by washing the catalyst with an alkaline solution such as sodium hydroxide, potassium hydroxide, sodium acetate, potassium acetate, and mixtures thereof. The catalyst is preferably a palladium metal or a catalyst comprising a combination of palladium and gold which has been preactivated with an alkaline material and which has been employed in the preparation of vinyl acetate from ethylene.

3,650,984

NITROALKANE OR NITROALKANOL COMPLEX WITH ALKYL-TIN OXIDE OR ALKYL-TIN CHLORIDE

Lawrence R. Jones, Terre Haute, Ind., assignor to Commercial Solvents Corporation

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,805

Int. Cl. C07f *7/22*; C08f *45/60, 45/62*

U.S. Cl. 260—429.7 8 Claims

Polyvinyl halide resin compositions including co-polymers thereof, stabilized against degradation by heat by incorporating therein from 1–10% by weight of a complex obtained by reacting a nitroalkane or nitroalkanol with bis(di-n-butyltin)oxide, bis(tri-n-butyltin)oxide or tri-n-butyltin chloride.

3,650,985

ETHYNYLATION CATALYST, CATALYST PREPARATION, AND PROCESS

Jack R. Kirchner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Oct. 23, 1967, Ser. No. 677,020, now Patent No. 3,560,576, dated Feb. 2, 1971. Divided and this application Mar. 4, 1970, Ser. No. 16,579

Int. Cl. C07c *33/04*

U.S. Cl. 252—431 23 Claims

Particulate catalysts, consisting essentially of cuprous acetylide complexes containing at least 1.75 carbon atoms per copper atom, and having a total surface area of

at least 5.0 square meters per gram, are prepared at 50–120° C. by the simultaneous action of formaldehyde and acetylene at a partial pressure of less than 2.0 atmospheres on cupric compounds slurried in substantially neutral aqueous media and used to catalyze ethynylation in a continuous stirred reaction at 60–120° C. and acetylene partial pressures below 2.0 atmospheres.

3,650,986

CARRIER CATALYST FOR THE MANUFACTURE OF UNSATURATED ESTERS OF CARBOXYLIC ACIDS

Kurt Sennewald and Wilhelm Vogt, Knapsack, near Cologne, Heinz Erpenbach, Surth, near Cologne, Hermann Glaser, Knapsack, near Cologne, and Helmut Dyrschka, Kottingen, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Dec. 5, 1968, Ser. No. 781,627

Claims priority, application Germany, Dec. 23, 1967, P 16 67 140.2

Int. Cl. C07c *67/04*

U.S. Cl. 252—431 C **4 Claims**

Carrier catalyst—and process for making and activating it—for the production of unsaturated esters of carboxylic acids from an olefinic compound, a carboxylic acid and molecular oxygen in the gas phase, the carrier catalyst containing palladium acetate, alkali metal acetate and one or more uranium compounds as its active constituents.

3,650,987

CATALYST BASED ON ALUMINUM FLUORIDE FOR THE GASEOUS PHASE FLUORINATION OF HYDROCARBONS

Martino Vecchio, Giovanni Groppelli, and Vittorio Fattore, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed July 18, 1969, Ser. No. 843,232

Claims priority, application Italy, July 25, 1968, 19,448/68

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 **2 Claims**

A catalyst is disclosed for the preparation of fluorinated hydrocarbons via fluorination of chlorofluorination reactions in gaseous phase, the catalyst consisting essentially of aluminum fluoride containing minor quantities of iron, chromium, and preferably also nickel compounds, present in quantities corresponding to the following percentages by weight of the metal (based on the total): from 0.1% to 5% of Fe, from 0.05% to 8.5% of Cr, and up to 5% of nickel. These metals are present, at least partially, in the form of halides, and in particular fluorides, or in the form of oxides or oxy-halides. The catalyst is prepared by adding iron or chromium compounds, and preferably also nickel compounds, in a subdivided form, to aluminum fluoride or alumina, and then subjecting the composition thus obtained to an activation treatment by heating at a temperature between 300° C. and 550° C. for from 0.5–4 hours in a current of nitrogen or air, and then subjecting said composition to a fluorination treatment by heating at 200°–500° C. in an HF current, suitably diluted with inert gases for the thermal control of the reaction, in order to convert, at least partially, the alumina and possibly also the other metal compounds into their respective fluorides. The catalyst thus obtained is employed for the fluorination in gaseous phase at elevated temperatures of halogenated ethanes containing at least one chlorine atom, in order to obtain high yields in fluorinated ethanes having a high degree of symmetry, by means of HF, or for the chlorofluorination in gaseous phase at elevated temperatures of ethylene or partially halogenated ethylenes by means of a mixture of $HF+Cl_2$, in order to obtain fluorinated or chlorofluorinated ethanes with a high degree of symmetry.

3,650,988

HYDROCARBON CONVERSION CATALYSTS

John S. Magee, Jr., Baltimore, and Warren S. Briggs, Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,134

Int. Cl. B01j *11/36, 11/40*

U.S. Cl. 252—451 **15 Claims**

A relatively low surface area highly stable and attrition resistant zeolite promoted hydrocarbon conversion catalyst wherein the semi-synthetic portion comprises a synthetic amorphous silica-alumina composite of which up to 50% of the synthetic alumina is derived from an alkali metal aluminate, and optionally clay. The catalyst finds utility in the conversion of hydrocarbons to more desirable derivatives thereof.

3,650,989

PREPARATION OF SILICA-ALUMINA CATALYST

Saul G. Hindin, Mendham, Joseph C. Dettling, Jackson, and William R. Larsen, Fords, N.J., assignors to Engelhard Minerals & Chemicals Corporation

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,576

Int. Cl. B01j *11/36, 11/40*

U.S. Cl. 252—451 **7 Claims**

A highly acidic silica-alumina catalyst, containing a relatively large amount of alkali metal, e.g. up to about 1%, is prepared by a process comprising acidifying an alkali metal silicate to a pH of less than about 5.0 to form a silica hydrogel, washing the hydrogel with water, slurrying the hydrogel in a solution of an aluminum salt, adding to the slurry an ammoniacal base in excess of the amount required for neutralization of the aluminum salt, and separating, drying and calcining the resultant silica-alumina composite.

3,650,990

CATALYST AND METHOD FOR PREPARING SAME

Vincent J. Frilette, Yardley, Pa., and Russell W. Maatman, Sioux Center, Iowa, assignors to Mobil Oil Corporation

No Drawing. Continuation-in-part of application Ser. No. 711,215, Mar. 7, 1968, which is a continuation-in-part of application Ser. No. 319,639, Oct. 29, 1963, now Patent No. 3,373,109, which in turn is a continuation-in-part of application Ser. No. 774,124, Nov. 17, 1958. This application Oct. 9, 1969, Ser. No. 865,173

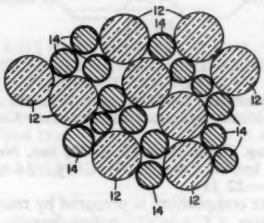
The portion of the term of the patent subsequent to Mar. 12, 1985, has been disclaimed

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **24 Claims**

Crystalline aluminosilicate zeolite having uniform pores of from greater than 6 angstroms to 15 angstroms in diameter and containing specified metal and/or metal ions therein, prepared by "growing" crystals of such aluminosilicate from an aqueous medium containing said metal in anionic form.

3,650,991
COMPOSITE SUPERCONDUCTIVE BODY COMPRISING A MATRIX OF POROUS GLASS AND A SUPERCONDUCTIVE MATERIAL
James H. P. Watson, 164 E. 4th St., Corning, N.Y. 14830
Filed Apr. 13, 1970, Ser. No. 27,564
Int. Cl. H01b *1/02*
U.S. Cl. 252—500 12 Claims



Disclosed is a composite superconductive body comprising a porous glass matrix having a granular system of superconductive material disposed within the pores thereof. Adjacent grains of superconductive material are spatially separated but are electrically connected by electron tunneling. The critical field of these granular superconductors can be modified by processing either the porous glass matrix or the molten superconductor prior to impregnation of the superconductive material into the matrix.

ERRATUM

For Class 260—46 see:
Patent No. 3,650,852

3,650,992
METHOD FOR IMPREGNATING POLYMER BEADS WITH A BLOWING AGENT
Edward J. Schwoegler, Munster, Ind., assignor to Cupples Container Co., Austin, Tex.
No Drawing. Filed Sept. 15, 1970, Ser. No. 72,554
Int. Cl. C08j *1/26*
U.S. Cl. 260—2.5 B 6 Claims

Particulate polymeric material, especially polystyrene, is impregnated with a blowing agent by suspending the particulate polymeric material in a suspension system comprising ethylene glycol and water, introducing a blowing agent, e.g., pentane, and maintaining under conditions of elevated temperature and pressure.

3,650,993
CRUSH-BEFORE-FINAL CURING PROCESS FOR MAKING DENSIFIED POLYURETHANE FOAM UTILIZING A VOLATILE ORGANIC FOAMING AGENT
Natale C. Zocco, East Haven, and Stanley I. Cohen, Orange, Conn., assignors to Olin Corporation, New Haven, Conn.
No Drawing. Continuation-in-part of application Ser. No. 780,247, Nov. 29, 1968. This application Apr. 6, 1970, Ser. No. 26,058
Int. Cl. B29d *27/04*; C08g *22/04, 53/10*
U.S. Cl. 260—2.5 BD 19 Claims

An improved process for preparing flexible, densified polyurethane foam is disclosed which comprises allowing a polyurethane foam forming reaction mixture containing an organic foaming agent to rise, thereby forming a partially cured cellular material, and applying a compressive force to the partially cured cellular material to permanently reduce its volume. The organic foaming agent inhibits the formation of outer layers of undensified polyurethane foam integral with the densified polyurethane foam. The resulting flexible, densified polyurethane foam is particularly useful for such applications as cushioning and rug padding.

3,650,994
POLYURETHANE COMPOSITIONS PREPARED FROM DIPHENYL ETHER-PHENOL RESINS AND POLYISOCYANATES
Llewellyn Delphin Booth, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 781,258, Dec. 4, 1968. This application July 27, 1970, Ser. No. 58,747
Int. Cl. C08g *22/44, 22/18*
U.S. Cl. 260—2.5 AM 2 Claims

The invention concerns polyurethane compositions derived from chloromethylated diphenyl ether-phenol resins and polyisocyanates. It relates more particularly to polyurethane foams of synthetic chloromethylated diphenyl ether-phenol resins and polyisocyanates. The foams are fire retardant and have improved physical properties.

3,650,995
SHAPED ARTICLES OF LATEX FOAM
Robert E. Erickson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,628
Int. Cl. C08f *47/08*; B29d *27/00*
U.S. Cl. 260—2.5 L 9 Claims

Shaped foam articles of the reactive latexes are readily prepared by casting the latex in the form of a wet froth comprising a polymer having certain reactive substituent groups such as carboxy and a water-dispersible coreactive material such as a melamine-formaldehyde condensate onto a porous mold and curing and drying the wet froth with an air circulating drying means.

3,650,996
WATER-DILUTABLE COATING COMPOSITIONS CONTAINING PHENOL RESOLS ETHERIFIED
Rolf Guldenpfennig, Dossenheim, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg-Wondsbek, Germany
No Drawing. Continuation of abandoned application Ser. No. 661,558, Aug. 18, 1967. This application Dec. 4, 1970, Ser. No. 95,384
Claims priority, application Germany, Sept. 9, 1966, R 44,090
Int. Cl. C08g *45/08*
U.S. Cl. 260—20 8 Claims

A water-dilutable heat-curable coating composition comprising:

(I) 50 to 99 percent by weight of hydrophilic plasticizing epoxy resin partial esters selected from the group consisting of:

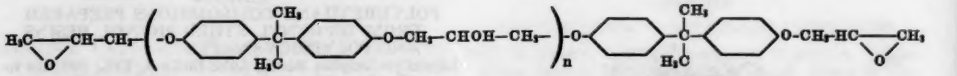
(1) the partial esters of compounds containing epoxy groups or hydroxyl groups produced by hydrolytic dissociation of said epoxy groups with at least one monocarboxylic acid and a polybasic carboxylic acid;

(2) the partial esters of compounds containing epoxy groups or hydroxyl groups produced by hydrolytic dissociation of said epoxy groups with a polybasic carboxylic acid; and

(3) a mixture of (1) and (2);

wherein said polybasic carboxylic acid comprises adducts selected from the group consisting of maleic acid with fatty acids and maleic anhydride with fatty acids, said fatty acids are selected from the group consisting of drying oil

acids, semi-drying oil acids, and mixtures of said oils with rosin acids, said fatty acids containing unsaturated monocarboxylic acids, the molar proportion of unsaturated monocarboxylic acid to maleic acid or maleic anhydride is between about 0.9:1 and 1.1:1 and said compounds containing epoxy groups or hydroxyl groups are epoxy resins having the general formula



wherein n represents molecular weights of between about 380 and 3500;

(II) strong nitrogenous bases to form soaps with the free carboxyl groups;

(III) water; and

(IV) 1 to 50 percent by weight of hydrophilic and water-soluble low molecular weight hardenable aldehyde condensation products such as etherified phenol resols alone or in combination with phenol resols and/or aminoplast-forming resins.

3,650,997

COATING COMPOSITIONS CONTAINING EPOXY RESINS AND CARBOXYL TERMINATED POLYESTERS

Joseph Welsfeld, Fair Lawn, Alfred M. Trivigali, Parsippany, Joseph F. Ackerman, Cedar Grove, and Joseph J. Bernardo, Lodi, N.J., assignors to Immont Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 710,656, Mar. 5, 1968. This application Aug. 13, 1970, Ser. No. 63,352

Int. Cl. C08g *39/10, 45/14;* **C09d** *3/66*

U.S. Cl. 260—21 **11 Claims**

Improved coating compositions comprising a blend of an epoxy resin and a polyester having a terminal carboxyl functionality between about two and four. The preferred polyester is the esterification product of (1) a hydroxyl terminated polyester and (2) a carboxylic acid-containing monoanhydride composition made up of a mixture of trimellitic anhydride and dodecenylsuccinic anhydride. Cratering of coatings has been very substantially reduced by use of terminally located dodecenylsuccinic anhydride-produced side chains on the polyester. Cratering is still further reduced and solubility parameters are improved by employing a glycidyl ester of a tertiary carboxylic acid, such as Cardura E, in the preparation of the hydroxyl terminated polyester.

3,650,998

HYDROXY-FUNCTIONAL HYDROPHYLIC RESINS BASED ON COPOLYMERS OF MONOVINYL AROMATIC COMPOUND AND HYDROXY-FUNCTIONAL MONOMER

Kazys Sekmakas and Edward A. Gauger, Jr., Chicago, and Lester A. Henning, Arlington Heights, Ill., assignors to Desoto, Inc., Des Plaines, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 615,048, Feb. 10, 1967, and Ser. No. 634,480, Apr. 28, 1967. This application Oct. 17, 1968, Ser. No. 768,549

The portion of the term of the patent subsequent to Nov. 30, 1988, has been disclaimed

Int. Cl. C08f *19/02, 27/12;* **C23b** *13/00*

U.S. Cl. 260—21 **18 Claims**

Hydroxy-functional hydrophylic resins dispersible in water with the aid of a base are based on copolymers such as styrene-allyl alcohol copolymers. These copolymers are partially esterified with drying oil fatty acid and then reacted with a monoanhydride to generate carboxy functionality. A portion of the carboxy functionality is consumed by reaction with an epoxide such as butylene oxide. The resins are dispersible in water with the aid of a base at low acid number.

3,650,999

POLY(ESTER-AMIDE) BLOCK COPOLYMER HOT MELT ADHESIVES

Joseph G. Martins, Ludlow, and Kenneth F. Ashley, Westfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 15, 1970, Ser. No. 46,490

Int. Cl. C08g *41/04;* **C09j** *3/14*

U.S. Cl. 260—22 D **20 Claims**

An adhesive composition is prepared by reacting a crystalline polyester, a C_{18} to C_{54} polycarboxylic acid and a primary diamine to form a poly(ester-amide) adhesive composition. This composition which is especially suited for use as a hot melt adhesive, provides adhesive bonds which are resistant to flow at 150° C.

3,651,000

STABLE EMULSIONS

Gene N. Woodruff, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 9, 1967, Ser. No. 681,890

Int. Cl. C08c *11/68*

U.S. Cl. 260—28.5 **4 Claims**

Stable emulsions are prepared from blends of asphalt with rubber and/or polyolefins utilizing dual function emulsifying agents containing both amino and carbonyl groups, which emulsion blends are useful as coatings for fabrics, etc., sheeting, and other structures requiring high resistance to weathering.

3,651,001

PIGMENTED PAINTS

Heinrich Meckbach, Leverkusen, Dietrich Glabisch, Opladen, and Herbert Bartl, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 12, 1968, Ser. No. 712,393

Claims priority, application Germany, Apr. 5, 1967, F 52,024

Int. Cl. C09d *3/00*

U.S. Cl. 260—29.6 **2 Claims**

A pigmented paint having a continuous aqueous phase including a binder of a copolymer of ethylene, a half ester of a α,β-unsaturated dicarboxylic acid or a salt thereof, vinyl chloride and vinyl ester in specified proportions.

3,651,002

ACRYLAMIDE TYPE SOIL STABILIZER CONTAINING EITHER SODIUM OR AMMONIUM ACRYLATE

Einosuke Higashimura and Eiichi Nakamura, Tokyo, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

No Drawing. Filed Apr. 22, 1968, Ser. No. 723,302

Claims priority, application Japan, May 4, 1967, 42/28,367; Jan. 31, 1968, 43/5,392; Feb. 8, 1968, 43/7,416

Int. Cl. C08f *15/18, 15/22, 45/44, 45/46;* **E02d** *3/12*

U.S. Cl. 260—29.6 TA **10 Claims**

A novel acrylamide type soil stabilizer comprising (1) an acrylamide, (2) a water-soluble cross linking agent,

(3) a member selected from the group consisting of sodium acrylate and ammonium acrylate in an amount of less than 10% based on the acrylamide, and (4) at least one member selected from the group consisting of sodium methacrylate, ammonium methacrylate, magnesium methacrylate and 2-hydroxyethyl methacrylate. This soil stabilizer provides a homogeneous aqueous solution which is stable even at a high concentration and has excellent soil stabilizing effect. The soil stabilizer is applied in the form of aqueous solution having a concentration of 2–20% together with a redox catalyst to soil to stabilize the same.

3,651,003
HEXA(ALKOXYMETHYL)MELAMINE-MODIFIED HYDROXYLATED FLUOROPOLYMER COATING COMPOSITIONS AND PROCESSES

Max F. Bechtold, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1968, Ser. No. 785,648
Int. Cl. C08g *37/32*
U.S. Cl. 260—31.2 XA **28 Claims**

Described are combinations of certain hydroxylated fluoropolymers and hexa(alkoxymethyl)melamines, both in the form of crosslinkable liquid mixtures and in the form of scratch-resistant, strongly adherent cross-linked coatings, methods of applying the coatings from the liquid mixtures, and solid objects, especially plastic objects, carrying the coatings.

3,651,004
SOLUTIONS OF POLYGLUTAMIC ACID DERIVATIVES

Yasuo Fujimoto and Yoichi Koiwa, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed May 6, 1970, Ser. No. 35,176
Claims priority, application Japan, May 7, 1969, 44/34,513
Int. Cl. C08g *51/36*
U.S. Cl. 260—31.2 N **7 Claims**

Treating solid polymers of polyglutamic acid derivatives with formic acid effectively dissolves out the higher molecular weight portions thereof, resulting in solutions which are stable and which do not become discolored with time. Shaped articles such as films made from the formic acid solutions of, for example, poly-γ-alkyl glutamates or copolymers thereof possess superior mechanical properties such as tensile strength and elongation.

3,651,005
COATING COMPOSITIONS OF AZIRIDINYL ALKYL ACRYLATE OR METHACRYLATE ACRYLIC GRAFT COPOLYMERS

Aloysius N. Walus, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 22, 1970, Ser. No. 100,829
Int. Cl. C08f *45/34, 45/36*
U.S. Cl. 260—31.2 **10 Claims**

The lacquer coating composition consists essentially of a graft copolymer dissolved in an organic solvent wherein the backbone of the graft copolymer is of polymerized soft acrylic constituents of an alkyl acrylate or an alkyl methacrylate in which the alkyl groups have 4–24 carbon atoms, and the copolymer has grafted into the backbone through a coupling unit of an aziridinyl acrylate or an aziridinyl methylacrylate a side chain of relatively hard polymerized monomer units, such as alkyl acrylates or alkyl methacrylates having 1–3 carbon atoms in the alkyl groups, acrylonitrile, methacrylonitrile and the like. The composition forms a high quality coating which is particularly useful as an exterior finish for automobiles and trucks.

3,651,006
BINDERS CONTAINING 1,3,5-TRIOXANE FOR THE PRODUCTION OF PROCESSED WOOD MATERIALS

Bruno Sander and Heinrich Sperber, Ludwigshafen (Rhine), Ernst-Heinrich Pommer, Limburgerhof, Pfalz, and Werner Helmut Clad and Otto Wittmann, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 19, 1968, Ser. No. 699,058
Claims priority, application Germany, Jan. 24, 1967, B 90,865
Int. Cl. C08g *37/08, 37/24, 51/34*
U.S. Cl. 260—33.2 **3 Claims**

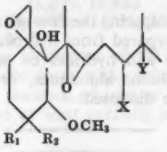
Binders for the production of processed wood materials and based on mixtures of wood adhesives, wood preservatives and organic solvents which contain 1,3,5-trioxane; and processed wood materials prepared therewith.

3,651,007
EPOXIDES

Hans-Peter Sigg, Binningen, and Christian Stoll, Basel, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

Filed Apr. 8, 1969, Ser. No. 814,388
Claims priority, application Switzerland, Apr. 16, 1968, 5,564/68, 5,566/68, 5,567/68
Int. Cl. C07d *1/18*
U.S. Cl. 260—348 R **3 Claims**

The invention provides new antibiotics derivatives of formula



in which either:

(i)

X and Y together form a second bond between the carbon atoms to which they are attached,
R_1 is a hydrogen atom, and
R_2 is a hydroxyl group,

(ii)

X and Y together with the carbon atoms to which they are attached form an epoxy group, and
R_1 and R_2 together form the oxo group=O, or

(iii)

X and Y together are a second bond between the carbon atoms to which they are attached and
R_1 and R_2 together form the radical

$$=N—NH—CO—NH_2$$

The new antibiotic derivatives are useful in inhibiting the production of antibodies and the formation of cellular immunity reactions.

3,651,008
POLYMERIC COMPOSITIONS AND THEIR METHOD OF MANUFACTURE

Billy G. Moser, Lake View Terrace, and Robert F. Landel, Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,636
Int. Cl. C08g *51/04;* C06b *1/04;* C08h *17/02*
U.S. Cl. 260—37 **7 Claims**

Filled polymer compositions made by dissolving the polymer binder in a suitable sublimable solvent, mixing

the filler material with the polymer and its solvent, freezing the resulting mixture, and subliming the frozen solvent from the mixture, removing it therefrom. The remaining composition is then suitable for conventional processing, such as compression molding or extruding. A particular feature of the method of manufacture is pouring the mixed solution slowly in a continuous stream into a cryogenic bath wherein frozen particles of the mixture result. The frozen individual particles are then subjected to the sublimation.

3,651,009

MODIFIED ELASTOMERIC ETHYLENE/PROPYLENE COPOLYMERS AND PROCESS FOR PRODUCING SAME

Nazzareno Cameli, Paolo Longi, and Alberto Valvassori, Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,076
Claims priority, application Italy, Apr. 14, 1969, 15,533/69
Int. Cl. C08f *17/00*
U.S. Cl. 260—41 R 12 Claims

Quaternary, sulfur-vulcanizable copolymers of ethylene, propylene, dicyclopentadiene and alkyltricyclo(6,2,1,$0^{2,7}$) 4,9-undecadiene are disclosed. Although at least half of the relatively expensive alkyltricyclo(6,2,1,$0^{2,7}$)4,9-undecadiene is replaced by relatively inexpensive dicyclopentadiene in the new copolymers, the copolymers, while being less expensive than the known ternary copolymers of ethylene, propylene, alkyltricyclo-undecadiene, have the same desirable properties of those known terpolymers, and have a faster vulcanization rate than ethylene/propylene/dicyclopentadiene copolymers prepared under like conditions.

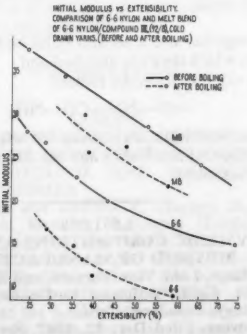
A process for preparing the new quaternary copolymers, using catalysts prepared from hydrocarbon-soluble vanadium compounds and hydrides or organometallic compounds of beryllium, aluminum, or lithium-aluminum complexes is also disclosed.

3,651,010

SYNTHETIC POLYAMIDE COMPOSITIONS

Clifton Douglas Cowell and Karl Anthonie Martin, Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 26, 1968, Ser. No. 740,195
Claims priority, application Great Britain, June 26, 1967, 29,430/67
Int. Cl. C08g *51/58*
U.S. Cl. 260—45.95 7 Claims



A polyamide composition which can be melt spun or shaped and, if necessary drawn, which composition comprises a class of phenols which confer increased resistance to deformation to the product.

3,651,011

CYCLIZATION OF 1,2-POLYBUTADIENE IN THE PRESENCE OF PHENOLIC ANTIOXIDANTS

Robert J. Schaffhauser, Brookside, and Chester L. Parris, Morris Plains, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed June 11, 1969, Ser. No. 832,488
Int. Cl. C08f *27/00*
U.S. Cl. 260—45.95 4 Claims

1,2-polybutadiene is cyclized within 10 hours to the point of complete elimination of vinyl unsaturation, at concentration in lower alkyl benzene in the range 3%–10% by weight, using a cationic agent, especially boron trifluoride, to promote the cyclization. The temperature employed is at most 105° C. An antioxidant such as a hindered polyphenol is included in the cyclization reaction mixture.

3,651,012

NOVEL BIS-IMIDE COMPOSITIONS AND POLYMERS THEREFROM

Fred F. Holub, Schenectady, and Carl M. Emerick, Mechanicville, N.Y., assignors to General Electric Company

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,430
Int. Cl. C08g *20/20*
U.S. Cl. 260—47 UA 6 Claims

The invention covers novel imide compositions, and coreaction products of the latter with copolymerizable monomers and various polymers and resins. The compositions herein described have many uses including insulation and protective applications as well as being useful in numerous molding applications.

3,651,013

ACRYLIC FIBER

Toshio Ohfuka, Yasushi Ichikawa, and Yoshiharu Sugaya, Shizuoka-ken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed June 16, 1969, Ser. No. 833,728
Claims priority, application Japan, June 14, 1968, 43/40,582
Int. Cl. C08f *15/40*
U.S. Cl. 260—49 6 Claims

Acrylic fiber having an improved antiflaming performance and comprising a copolymer of more than 55 wt. percent acrylonitrile, 5–25 wt. percent vinylidene chloride, 4–25 wt. percent methacrylonitrile and 3–14 wt. percent acrylamide and/or methacrylamide.

3,651,014

SEGMENTED THERMOPLASTIC COPOLYESTER ELASTOMERS

William K. Witsiepe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 843,243, July 18, 1969. This application June 22, 1970, Ser. No. 48,503
Int. Cl. C08g *17/08*
U.S. Cl. 260—75 R 11 Claims

A segmented thermoplastic copolyester elastomer containing recurring polymeric long chain ester units derived from dicarboxylic acids and long chain glycols and short chain ester units derived from dicarboxylic acids and low molecular weight diols. About 50–90% of the total number of short chain ester units must be derived from a single dicarboxylic acid and a single low molecular weight diol. The elastomers have exceptional properties, particularly tear-strength, abrasion resistance and resistance to oil swell.

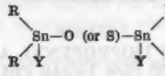
3,651,015

PROCESS FOR PRODUCING POLYACETAL RESIN

Shinichi Ishida, Tokyo, Noboru Ohshima, Saitama-ken, Norimasa Fujita and Kyoichiro Mori, Yokohama, and Kunio Kurita, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 3, 1969, Ser. No. 813,016
Claims priority, application Japan, Mar. 5, 1969, 44/16,210
Int. Cl. C08g *1/02, 1/20, 3/00*
U.S. Cl. 260—64 16 Claims

Polyacetal resin having good mechanical properties is prepared commercially advantageously by polymerizing formaldehyde containing up to 6% water or copolymerizing the formaldehyde with a monomer copolymerizable with formaldehyde using a tetravalent organo-tin compound represented by the following formula as a catalyst,



wherein R is a hydrocarbon radical, Y is halogen, hydroxy, thiocyano, alkoxy, thioalkoxy or alkoxycarbonyl group, and acylating the thus obtained polymer or copolymer.

3,651,016

METHOD FOR THE PRODUCTION OF FILM- AND FIBER-FORMING POLYESTERS WITH A NOVEL METALLIC CATALYST

Josef Hrach and Theodor Wimmer, Tyrol, Austria, assignors to Alpine Chemische Aktiengesellschaft, Kufstein, Tyrol, Austria

No Drawing. Filed Dec. 21, 1967, Ser. No. 692,275
Claims priority, application Austria, Dec. 30, 1966, 12,053/66; June 2, 1967, 5,144/67
Int. Cl. C08g *17/013*
U.S. Cl. 260—75 R 5 Claims

Film- and filament-forming color-stable polyesters or copolyesters of dicarboxylic acids, such as terephthalic, iso-phthalic, diphenyldicarboxylic and adipic acids, and a diol, such as ethylene glycol, 1,4-bis(hydroxy methyl) cyclohexane and bis-phenol-A-diglycolether, are reacted under polymerizing conditions in the absence of oxygen and in the pressure of a polymerization catalyst consisting of a mixture of (a) metallic antimony, (b) metallic lead, and (c) metallic zinc. Instead of a dicarboxylic acid, a functional, polyester-forming derivative thereof may be used, preferably the dimethyl ester. The lead component (b) of the catalyst may be replaced in whole or part by tin, and the catalyst preferably is in the form of an alloy.

3,651,017

PROCESS FOR THE PREPARATION OF POLYESTERS

Kenichi Tanabe, Kazuo Itoi, and Hirozo Segawa, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,360
Claims priority, application Japan, Dec. 29, 1967, 43/85,175
Int. Cl. C08g *17/015*
U.S. Cl. 260—75 R 10 Claims

Process for the preparation of a polyester in which at least 80% of the recurring structural units are composed of ethylene terephthalate units, which comprises polycondensing bis(β-hydroxyethyl)terephthalate, or a mixture of bis(β-hydroxyethyl)terephthalate of the quantity sufficient to give at least 80% of ethylene terephthalate units to the product polyester, with the balance quantity of at least one comonomer which is copolycondensable with the terephthalate, in the presence of a polycondensation catalyst, characterized in that the polycondensation catalyst is composed of at least one germanium compound and at least one alkaline substance selected from the group consisting of alkali metals, and hydrides, hydroxides, oxides, alcoholates, and inorganic and organic acid salts of alkali metals.

3,651,018

USE OF A GERMANIUM-CONTAINING POLYCONDENSATION CATALYST IN THE PREPARATION OF POLYETHYLENE TEREPHTHALATE

Gerhard Schade, Witten-Bommern, and Franz Blaschke, Witten (Ruhr), Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,183
Claims priority, application Germany, Nov. 28, 1968, P 18 11 446.0
Int. Cl. C08g *17/015*
U.S. Cl. 260—75 R 6 Claims

A process for the preparation of polyethylene terephthalate by the polycondensation of oligomeric ethylene terephthalate. A glycolic solution of triethylammonium or tripropylammonium germanate is employed as the catalyst in the process. The catalyst is prepared by adding the respective trialkylamine to an aqueous-glycolic slurry of germanium dioxide.

3,651,019

PRODUCTION OF ADDUCTS OF CARBON TETRACHLORIDE OR CHLOROFORM WITH OLEFINICALLY UNSATURATED SUBSTANCES

Meir Asscher, Rehovoth, Aharon Katchalsky, Tel-Aviv, and David Vofsi, Rehovoth, Israel, assignors to Yeda Research & Development Company Ltd., Rehovoth, Israel

No Drawing. Continuation-in-part of applications Ser. No. 223,543 and Ser. No. 233,549, both Sept. 13, 1962. This application July 27, 1965, Ser. No. 475,274
Claims priority, application Israel, Sept. 28, 1961, 16,079, 16,080
Int. Cl. C07c *121/06, 21/04*
U.S. Cl. 260—77.2 8 Claims

A process for the production of 1:1 adducts of carbon tetrachloride or chloroform with olefinically unsaturated compounds in the presence of iron or copper compound catalysts, which are at least partially in reduced valence states.

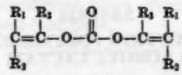
3,651,020

ADDITION HOMOPOLYMERS OF DIVINYL CARBONATES

David Rhum, Westfield, and Lester Weintraub, Livingston, N.J., assignors to Air Reduction Company, Incorporated, New York, N.Y.

No Drawing. Continuation of application Ser. No. 591,091, Nov. 1, 1966. This application Nov. 7, 1969, Ser. No. 871,570
Int. Cl. C08g *17/13*
U.S. Cl. 260—77.5 UA 3 Claims

There are provided addition homopolymers of a carbonate having the formula



wherein R_1, R_2 and R_3 are hydrogen, phenyl or alkyl containing up to 20 carbon atoms.

3,651,021

ETHYLENICALLY UNSATURATED POLYLACTONE-BASED POLYURETHANE ELASTOMER AND VULCANIZATES THEREFROM

Harrison S. Kincaid, Moorestown, and Fritz Hostettler, Verona, N.J., and Harry Vineyard, South Charleston, W. Va., assignors to Union Carbide Corporation

No Drawing. Filed May 3, 1968, Ser. No. 726,589
Int. Cl. C08g *22/10*
U.S. Cl. 260—77.5 AN 15 Claims

Polyethylenically unsaturated polyurethane elastomers can be prepared by reacting an ethylenically unsaturated

polylactone diol, an organic diisocyanate, and a difunctional glycol chain extender at an isocyanato/hydroxyl ratio of approximately one. These elastomers can be cross-linked by methods employed in the natural and synthetic rubber arts to yield useful and desirable vulcanizates.

3,651,022

PROCESS FOR PREPARING A POLYAMIDE

Donald A. Holmer and Oscar A. Pickett, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,247

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **8 Claims**

Linear polyamides from which useful fibers may be conventionally melt-spun can be prepared in a relatively short time and with no substantial polymer gelation by heating a mixture of polyamide-forming reactants consisting essentially of 4,4′-methylene dianiline and from 1.01 to 1.09 moles of azelaic acid, sebacic acid, 1,11-undecanedioic acid, 1,12-dodecanedioic acid or a mixture of two or more of such acids per mole of the 4,4′-methylene dianiline in an inert atmosphere at a temperature between the melting point of the resulting polyamide and about 350° C. and in the absence of an extraneous polyamidation catalyst.

3,651,023

PREPARATION OF POLYAMIDES WITH SPECIAL PROPERTIES

Johannes H. Ottenheym, Sittard, and Pieter C. A. Van Krimpen and Pierre J. Franssen, Stein, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Filed July 2, 1968, Ser. No. 741,897

Int. Cl. C08g *20/08, 20/12, 41/00*

U.S. Cl. 260—78 L **1 Claim**

There is provided a polyamide composition containing at least one additive of lysine, α-amino-ε-caprolactam, ε-N—R-lysine (wherein R stands for a bivalent hydrocarbon radical), α-N—R-α-amino-ε-caprolactam (wherein R stands for a bivalent hydrocarbon radical), N,N′-bis hexahydro-azepin-2-oxo-3-yl)-R (wherein R stands for a diamine or a diamide) and 1 N, 3 N, 5 N-tri(hexahydro-azepin-2-oxo-3-yl)-triazine-1,3,5 and a process for producing the same. Preferably the additive is contained in the composition in amounts of 0.5 to 5% by weight of the polyamide. The composition is useful for spinning into fibers and yarns and improves color intensity, modulus of elasticity and flat spotting.

3,651,024

ANIONIC SOLUTION POLYMERIZATION OF LAUROYL LACTAM

Michel Biensan, Billere, and Philippe Bruant, Pau, France, assignors to Societe Nationale des Petroles d'Aquitaine Tour Aquitaine, Courbevoie, France

No Drawing. Filed Dec. 23, 1969, Ser. No. 887,761

Claims priority, application France, Dec. 31, 1968, 182,522

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L **10 Claims**

Polyamide powders are obtained by adding to a lactam solution, a fine polyamide powder in an amount of at least 20% of the total weight of the lactam and polyamide and thereafter heating the solution, an anionic catalyst and an activator to a polymerization temperature below the melting point of the lactam.

3,651,025

DIENE POLYMERIZATION PROCESS

Arthur R. Bean, Jr., Buena Park, Mary J. Papavasiliou, Gardena, and John L. Snyder, Long Beach, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,006

Int. Cl. C08d *5/02*; C08f *27/00*

U.S. Cl. 260—78.4 D **4 Claims**

Conjugated diene polymers having improved processability, better dryability, green strength, and resistance to cold flow are prepared by polymerization of a conjugated diene coupling of the product with a multi-functional coupling agent and reinitiation of the polymerization to form a mixture of polymeric species.

3,651,026

COPOLYMERS OF ISOPROPENYL ALKYL ETHERS AND PROCESS FOR THEIR PRODUCTION

Kurt Moser, Fribourg, Beat Hochli, Bern, and Theodor Volker and Paul Wicht, Friboug, Switzerland, assignors to Lonza Ltd., Basel, Switzerland

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,083

Claims priority, application Switzerland, Jan. 17, 1969, 617/69; Dec. 3, 1969, 17,985/69

Int. Cl. C08f *15/00, 15/40*

U.S. Cl. 260—78.5 R **11 Claims**

Isopropenyl alkyl ethers may be copolymerized with other unsaturated monomers such as esters of unsaturated dicarboxylic acids, olefins, vinyl esters or acrylates. Polymerization is effected by known radical catalysts and may be conducted as a reaction, emulsion, suspension, solution or precipitation process.

3,651,027

POLYURETHANE BLOCK ELASTOMERS

Jean Robin, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Feb. 7, 1969, Ser. No. 797,675

Claims priority, application France, Feb. 9, 1968, 139,336

Int. Cl. C08g *22/24*

U.S. Cl. 260—75 NH **6 Claims**

The invention provides new polyurethane block elastomers of good mechanical properties and resistance to yellowing made by condensing bis(4-isocyanato-cyclohexyl)methane with an α,ω-dihydroxy macrodiol and coupling the isocyanate-terminated prepolymer obtained with 3,3-bis(aminomethyl)-oxacyclobutane.

3,651,028

MODIFIED POLYOLEFIN COMPOSITION

Kenichi Maemoto, Ibaraki, and Takeshi Shimamura, Niihama, Japan, assignors to Sumimoto Chemical Co., Ltd., Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 680,332, Nov. 3, 1967, which is a division of application Ser. No. 530,400, Feb. 28, 1966, now Patent No. 3,418,395. This application Mar. 29, 1968, Ser. No. 717,406

Int. Cl. C08f *27/08*

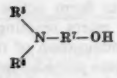
U.S. Cl. 260—78.5 T **4 Claims**

This invention is directed to a modified copolymer of ethylene and maleic acid ester compound or an acrylic acid ester compound of the formula:

$$CHR^1{=}CR^2COOR^3$$

wherein R^1 is a hydrogen atom or —$COOR^4$, R^2 is a hydrogen atom or methyl radical, each of R^3 and R^4 being an alkyl radical of from 1 to 5 carbon atoms, said copoly-

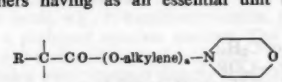
mer being modified by treatment with (1) an amino-alcohol of the formula:



wherein each of R^5 and R^6 is a hydrogen atom, or a hydrocarbon radical, such as alkyl, cycloalkyl, aralkyl or an aryl radical, the hydrogens of said hydrocarbon radical of which may be substituted with amino or alkyl-substituted amino radicals, R^7 is a divalent aliphatic, alicyclic or aromatic hydrocarbon radical or (2) an alcohol containing a nitrogen-containing heterocyclic radical and having the general formula X—R^8—OH, wherein R^8 is a divalent aliphatic hydrocarbon radical and X is a nitrogen-containing heterocyclic radical. The invention also relates to the method of producing the aforesaid modified copolymers.

3,651,029
LUBRICATING OIL ADDITIVES
Takehiko Fujimoto, Mikio Nishimura, and Shoji Takigawa, Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan
No Drawing. Filed Aug. 22, 1969, Ser. No. 852,485
Claims priority, application Japan, Aug. 26, 1968, 43/61,061
Int. Cl. C08f *19/00*
U.S. Cl. 260—78.5 E **6 Claims**

Copolymers having as an essential unit thereof the radical



where *a* is an integer of 1 or higher and R is hydrogen or methyl, are added to lubricating oils to improve the detergency, dispersancy and viscosity index thereof.

3,651,030
PROCESS FOR MAKING A MEMBRANE
Charles W. Desaulniers, Franklin, Cheryl A. Ford, Dedham, and Richard W. Mayo, Winchester, Mass., assignors to Amicon Corporation, Lexington, Mass.
No Drawing. Filed July 5, 1968, Ser. No. 742,516
Int. Cl. C08g *23/00, 33/00*
U.S. Cl. 260—79.3 **6 Claims**

A process for forming highly wettable and rewettable polysulfone membrane useful in fuel cells as moisture vapor transmissive, yet hydrogen retentive, barriers.

This process comprises the steps of subjecting a microporous membrane to treatment in an acidic bath to enable the pores to imibibe water more readily and more completely. In the preferred and most advantageous aspects of the invention, an anisotropic polysulfone membrane having a microporous barrier layer about 0.1 to 5 microns thick which layer comprises about 1% by volume of pores having an average diameter of from 20 to 100 angstroms is treated with the acid to form a novel, high performance membrane.

3,651,031
PREPARATION OF POLYTHIIRANES
Bernard Boucheron, Bethune, France, assignor to Societe Anonyme: Ethylene-Plastique, Paris, France
No Drawing. Filed Dec. 10, 1968, Ser. No. 782,755
Claims priority, application Great Britain, Dec. 14, 1967, 56,849/67
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 **6 Claims**

Process for the preparation of thermostabilisable polythiiranes in which polymerisation is effected in a polymerisation medium containing or consisting of dimethyl sulfoxide and a catalyst selected from the group consisting of a tetraphenyl phosphonium salt and a tetraalkyl ammonium salt.

3,651,032
VULCANIZABLE ETHYLENE/PROPYLENE COPOLYMERS AND PROCESS FOR PREPARING SAME
Nazzareno Cameli, Paolo Longi, Alberto Valvassori, and Sandro Parodi, Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio
No Drawing. Filed June 10, 1970, Ser. No. 45,256
Claims priority, application Italy, June 11, 1969, 18,049/69
Int. Cl. C08f *17/00*
U.S. Cl. 260—79.5 B **11 Claims**

Vulcanizable copolymers of ethylene, propylene, dicyclopentadiene and hexadiene-1,4 are disclosed, as well as a process for preparing them. The copolymers have the same characteristics of vulcanizability and fast vulcanization rate as do copolymers of ethylene, propylene and hexadiene-1,4, but are less costly.

3,651,033
DYEABLE ACRYLONITRILE COPOLYMERS CONTAINING VINYL PHENYL ALKYL QUATERNARY AMMONIUM COMPOUNDS
Ardy Armen, Amsterdam, Netherlands, and Gary G. Hammer and John H. Hennes, Williamsburg, Va., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed June 17, 1969, Ser. No. 834,158
Int. Cl. C08f *17/00*
U.S. Cl. 260—80.72 **6 Claims**

Vinyl phenyl alkyl quaternary ammonium compounds, e.g. p-vinyl benzyl methyl morpholinium chloride, are copolymerized in amounts of 0.25 to 7% with at least 85% acrylonitrile and, 1 to 10% of a monomer copolymerizable with acrylonitrile, e.g. methyl acrylate. The resulting polymer, upon spinning, gives fibers having excellent dyeability and heat stability.

3,651,034
CROSS-LINKED ETHYLENE VINYL AZETIDINONE COPOLYMERS
Eduard Kaiser, Kelkheim, Taunus, Helmut Korbanka, Gersthofen, and Hans Dieter Stemmer, Hattersheim (Main), Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Nov. 21, 1969, Ser. No. 878,932
Claims priority, application Germany, Dec. 13, 1968, P 18 14 447.3
Int. Cl. C08f *15/02, 15/40, 27/00*
U.S. Cl. 260—80.72 **10 Claims**

Cross-linked ethylene copolymers which are prepared from ethylene coplymers consisting of at least 50% by weight of ethylene and 0.5 to 40% by weight of monomers carrying azetidinone rings, which copolymers are cross-linked by heat treatment.

3,651,035
COPOLYMERS OF ALKYL STYRENES AND N-VINYL HETEROCYCLIC MONOMERS AND INVERSE SUSPENSION POLYMERIZATION USING THE SAME
Bobby Leroy Atkins, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 12, 1970, Ser. No. 19,128
Int. Cl. C08f *19/02*
U.S. Cl. 260—88.1 P **4 Claims**

This invention relates to a new interpolymeric composition of matter and particularly to copolymers of certain alkyl substituted alkenyl aromatic monomers and N-vinyl heterocyclic monomers. The new copolymers find utility as suspending agents for water-in-oil dispersions and as water dispersible coatings.

3,651,036

STABLE ANAEROBIC CURABLE SEALING COMPOSITIONS CONTAINING ZINC CHLORIDE AND TETRAHYDROQUINOLINE

Eisuke Watanabe and Masayashi Ozono, Tokyo, Japan, assignors to Tokyo Three Bond Co., Ltd., Tokyo, Japan

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,920

Int. Cl. C08f *3/64, 3/66*

U.S. Cl. 260—89.5 10 Claims

The present invention relates to an anaerobic curable sealing composition comprising 100 parts by weight of acrylic ester monomer containing polymerization initiator capable of imparting anaerobic property, 0.1 to 20 parts by weight of zinc chloride and 0.01 to 20 parts by weight of tetrahydroquinoline added thereto, which composition maintains preservation in the air and cures in extremely short periods of time under the condition of air-exclusion.

3,651,037

PROCESS FOR PREPARING HIGH-SOLIDS CHLOROPRENE POLYMER LATEX

Austin Matthew Snow, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 669,720, Sept. 22, 1967. This application Sept. 30, 1969, Ser. No. 862,451

Int. Cl. C08f *3/16*

U.S. Cl. 260—92.3 4 Claims

High-solids chloroprene polymer latexes are prepared by polymerizing chloroprene in an alkaline aqueous emulsion containing critical amounts of the potassium salts or a mixture of the sodium and potassium salts of (1) disproportionated wood rosin acids, (2) a formaldehyde condensate of a naphthalene sulfonic acid, and (3) a polymerized unsaturated fatty acid.

3,651,038

PROCESS FOR PREPARING HIGH-SOLIDS CHLOROPRENE POLYMER LATEX

Austin Matthew Snow, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 669,720, Sept. 22, 1967. This application Sept. 30, 1969, Ser. No. 862,449

Int. Cl. C08f *3/16*

U.S. Cl. 260—92.3 4 Claims

High-solids chloroprene polymer latexes are prepared by polymerizing chloroprene in an alkaline aqueous emulsion containing critical amounts of the potassium salts or a mixture of sodium and potassium salts of (1) wood rosin acid, (2) a formaldehyde condensate of a naphthalenesulfonic acid, and (3) a polymerized unsaturated fatty acid.

3,651,039

β-ALANINE[1] AND γ-AMINOBUTYRIC ACID[1]-A.C.T.H. PEPTIDES

Masahiko Fujino, Takarazuka, Chitoshi Hatanaka, Kyoto, and Osamu Nishimura and Yasushi Sanno, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

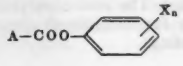
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,066

Claims priority, application Japan, Dec. 29, 1967, 43/84,700, 43/84,701, 43/84,702; Feb. 8, 1968, 43/7,865; Feb. 9, 1968, 43/8,076, 43/8,077; Apr. 24, 1968, 43/27,565; Nov. 9, 1968, 43/82,160; Nov. 20, 1968, 43/85,113

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 3 Claims

Novel peptide synthesis is provided, involving the use of compounds of the formula



wherein A represents dichloromethyl or trichloromethyl, X represents chloro or nitro, and *n* represents an integer of 1 to 5, inclusive, to form active esters with peptide fragments, said active esters reacting with other peptide fragments to effect condensation of the said peptide fragments. This novel process provides better yield and purity when compared with the use of N,N'-dicyclohexyl carbodiimide as a condensing agent. Novel peptides with ACTH-type activity have been prepared by this novel synthesis and include [β-alanine[1]]α-ACTH(1–23 amide), [γ-aminobutyric acid[1]]-ACTH(1–24) and [β-alanine[1]]-ACTH(1–24).

3,651,040

WATER-INSOLUBLE PHENYL-AZO-PHENYL MONOAZO DYESTUFFS

Winfried Kruckenberg, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

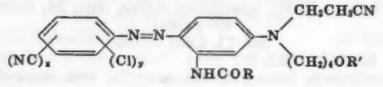
No Drawing. Filed Feb. 12, 1969, Ser. No. 798,767

Claims priority, application Germany, Feb. 23, 1968, P 17 19 076.0

Int. Cl. C07c *107/06;* C09b *29/08*

U.S. Cl. 260—207.1 6 Claims

Water-insoluble orange to red monoazo dyestuffs of the formula



in which

R is CH_3 or C_2H_5;
R' is H or —COR";
R" is CH_3, C_2H_5, OCH_3 or OC_2H_5;
x is 1 or 2; and
y is 0, 1, 2 or 3;

are disclosed for dyeing hydrophobic fiber materials, e.g. polyester. The dyeings are characterized by good fastness to alkaline boiling and good fastness to sublimation.

3,651,041

ACID ION EXCHANGERS DERIVED FROM AGAROSE

Horst D. Schell and Victor F. Ghetie, Bucharest, Rumania, assignors to Institutul de Biochimie, Bucharest, Rumania

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,624

Claims priority, application Rumania, Mar. 30, 1968, 57,502

Int. Cl. C07c *47/18*

U.S. Cl. 260—209 R 5 Claims

The present invention deals with the synthesis of new strong acid ion exchangers derived from agarose.

The procedure for obtaining the derivatives, according to the invention, consists in the introduction of sulphoethyl groups either into simple agarose molecule or into agarose cross-linked through glyceric bridges by means of epichlorohydrin.

3,651,042

SEPARATION OF THE COMPONENTS OF THE GENTAMICIN COMPLEX

Joseph A. Marquez, Montclair, Gerald H. Wagman, East Brunswick, and David J. Cooper, North Plainfield, N.J., assignors to Schering Corporation, Bloomfield, N.J.

Continuation-in-part of abandoned application Ser. No. 743,740, July 10, 1968. This application Dec. 24, 1968, Ser. No. 786,777

Int. Cl. C07d *7/18*

U.S. Cl. 260—210 AB 6 Claims

This invention relates to three heretofore unseparated antibiotic substances gentamicin C_1, gentamicin C_2 and

gentamicin C_{1a}; to their novel structures and to methods by which they may be separated, one from the other.

3,651,043
AGAROSE BASED ANION EXCHANGERS
Horst D. Schell and Victor F. Ghetie, Bucharest, Rumania, assignors to Institutul de Biochimie, Bucharest, Rumania
No Drawing. Filed Apr. 1, 1969, Ser. No. 812,423
Claims priority, application Rumania, Mar. 30, 1968, 57,505
Int. Cl. C07c *47/18*
U.S. Cl. 260—209 R 5 Claims

The present invention deals with the synthesis of new basic ion exchangers of medium strength derived from agarose.

The procedure for obtaining these derivatives, according to the invention, consists in reacting simple or glyceric bridge cross-linked agarose with an equimolecular mixture of epichlorohydrin and triethanolamine.

3,651,044
PROCESS FOR PREPARING 5-HALOCYTOSINE-1-NUCLEOSIDES
James H. Hunter, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed Feb. 24, 1966, Ser. No. 529,626
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R 5 Claims

Cytosine-1-nucleosides can be halogenated using an N-halo cyclic imide, e.g., N-bromosuccinimide. Glacial acetic acid is a preferred reaction medium. The novel compounds 1-β-D-arabinofuranosyl-5-(chloro-, bromo-, and iodo-) cytosine were prepared directly from cytosine arabinoside and found to have the antiviral and antitumor activity of cytosine arabinoside. The new compounds are less toxic in the animal body than cytosine arabinoside.

3,651,045
9-(β-D-ARABINOFURANOSYL)ADENINE ESTERS AND METHODS FOR THEIR PRODUCTION
Theodore H. Haskell, Ann Arbor, Mich., and Stephen Hanessian, Beaconsfield, Quebec, Canada, assignors to Parke, Davis & Company, Detroit, Mich.
No Drawing. Filed Oct. 21, 1968, Ser. No. 769,423
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R 5 Claims

9-(β-D-arabinofuranosyl)adenine esters, such as 9-(β-D-arabinofuranosyl)adenine, triacetate ester and N'-(9-β-D-arabinofuranosyl - 9H-purin-6-yl) - N,N-dimethylformamidine, triformate ester, and their production by reacting 9-(β-D-arabinofuranosyl)adenine with a reactive derivative of an alkanoic acid or with (chloromethylene) dimethylammonium chloride. The ester compounds are useful as antiviral agents that are more efficiently absorbed upon oral administration to standard experimental animals than is 9-(β-D-arabinofuranosyl)adenine.

3,651,046
QUINAZOLINO-BENZODIAZEPINES AND METHODS FOR THE PREPARATION THEREOF
Michael Edward Derieg, West Orange, Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Jan. 30, 1969, Ser. No. 795,345
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 25 Claims

A new class of pharmaceutically active tetracyclic compounds is described. The subject compounds are derivatives of benzodiazepines. The tetracyclic compounds are useful as sedatives, muscle relaxants and anti-convulsant agents.

3,651,047
IODINATION OF 2,3-DIHYDRO-1,4-BENZODIAZEPINES
George Francis Field, West Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed June 1, 1970, Ser. No. 42,524
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD 7 Claims

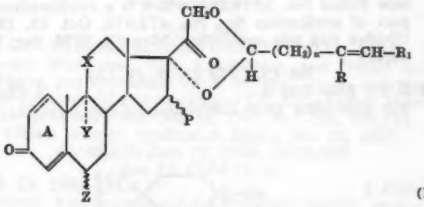
A process for the iodination of 2,3-dihydro-1,4-benzodiazepines comprising first treating the uniodinated 1,4-benzodiazepines with iodine monochloride, in the presence of an inert solvent and then treating the resulting product with a weak reducing agent is disclosed. The so-obtained iodinated 2,3-dihydro-1,4-benzodiazepines are useful as sedatives, muscle relaxants and anti-convulsants.

3,651,048
PURIFICATION PROCESS
Charles George Lex, Kenosha, Wis., assignor to Abbott Laboratories, Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 809,963, Mar. 24, 1969. This application Feb. 25, 1970, Ser. No. 14,232
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.5 7 Claims

Crystalline, pure piperazine estrone sulfate is obtained by refluxing the crude material in a low-boiling alcohol containing a small amount of a weak base and a small amount of water, filtering the solution while still hot, concentrating the filtrate and cooling it slowly.

3,651,049
17α,21 ALKENYLIDENE DIOXY DERIVATIVES OF PREGNANE AND PROCESS FOR PREPARATION THEREOF
Jacques R. Boissier, Paris, and Roger Ratouis, Saint-Cloud, France, assignors to Societe Anonyme dite: Roussel-UCLAF, Paris, France
No Drawing. Filed Mar. 12, 1970, Ser. No. 19,076
Claims priority, application France, Mar. 21, 1969, 6908232
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 10 Claims

Cyclic acetal derivatives of pregnane of general formula:



(I)

wherein X:CO or CH_2 or CHOH—Y:H or F—Z:H or CH_3—P:H or alkyl or alkylidene—n: 0 or 1—R:H or halogen or alkyl—R_1:H or alkyl or carboxyl or alkoxycarbonyl—broken line in the ring A:optional presence of a double bond.

These products are very useful substances in human and animal therapy, especially owing to their remarkable anti-inflammatory action.

The products are prepared by action of a dialkyl acetal on a pregnane derivative having hydroxyl radicals in its 17 and 21 positions, in the presence of an acid catalyst.

3,651,050

ACYLATION OF 6-AMINOPENICILLANIC ACID AND 7-AMINOCEPHALOSPORANIC ACID

Susumu Nakanishi, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,604
Int. Cl. C07d *99/24, 99/16*
U.S. Cl. 260—239.1 14 Claims

The acylation of 6-aminopenicillanic acid and 7-aminocephalosporanic acid using carboxylic acids with hexachlorocyclotriphosphatriazine or hexabromocyclotriphosphatriazine as acylating agents is described.

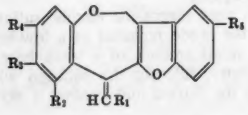
3,651,051

BENZO[b]BENZOFURANO[2,3-e]OXEPINES

Fernand Binon, Strombeek-Bever, and Marcel Louis Victor Descamps, Crainhem, Belgium, assignors to Laboratoires Labaz, Paris, France

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,388
Claims priority, application Great Britain, Dec. 20, 1968, 60,855/68
Int. Cl. C07d *51/70*
U.S. Cl. 260—240 TC 3 Claims

Novel serotonin and histamine antagonists of the formula



wherein R_1 is β-dimethylaminoethyl, β-dimethylaminoisopropyl, β-piperidinoethyl, ethyl-β-(4-methylpiperazino), methyl-(1-methyl-2-piperidyl) or 1-methyl-3-piperidyl; R_2 is hydrogen or methyl; R_3 is hydrogen, chlorine, methyl or methoxy; R_4 is hydrogen or methyl and R_5 is hydrogen, chlorine or methoxy.

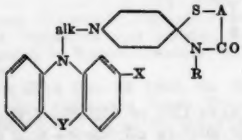
3,651,052

PIPERIDINE SPIRO COMPOUNDS

Michio Nakanishi, Oita, Katsuo Arimura and Tatsumi Tsumagari, Fukuoka, and Masami Shiroki, Oita, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Higashi-ku, Osaka, Japan

No Drawing. Application July 3, 1969, Ser. No. 839,046, now Patent No. 3,574,204, which is a continuation-in-part of application Ser. No. 675,074, Oct. 13, 1967. Divided and this application May 18, 1970, Ser. No. 48,739
Int. Cl. C07d *93/06, 29/120*
U.S. Cl. 260—243 R 8 Claims

The piperidine spiro compounds of the formula:



wherein X is H, Cl, CH_3—, CF_3—, CH_3O—, CH_3— or CH_3CO; Y is —S— or —CH_2CH_2—; alk is alkylene of 2 to 4 carbon atoms (e.g. ethylene, propylene, trimethylene or 2-methyltrimethylene); A is methylene, ethylene or ethylidene; and R is H or lower alkyl of at most 4 carbon atoms (e.g. methyl, ethyl, propyl or butyl) are useful as tranquilizers.

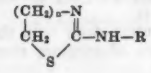
3,651,053

1,3-THIAZINES

Gerhard Sagner, Wuppertal-Vohwinkel, and Otto Behner, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 2, 1969, Ser. No. 812,904
Claims priority, application Germany, Apr. 27, 1968, P 17 67 335.7
Int. Cl. C07d *93/06*
U.S. Cl. 260—243 R 4 Claims

Thiazines of the formula:



wherein

R is substituted phenyl and

n stands for 1 or 2.

or a physiologically acceptable salt thereof, have been found to be useful for their analgesic, sedative and muscle relaxant properties in animals and have also exhibited utility as anaesthetics for animals.

3,651,054

3,5-DISUBSTITUTED 1,2,4-OXADIAZOLES

Aldo Joseph Crovetti, Lake Forest, and Anne Mary Von Esch, North Chicago, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Jan. 31, 1967, Ser. No. 612,778
Int. Cl. C07d *85/52, 87/38*
U.S. Cl. 260—247.5 R 12 Claims

Compounds comprising 3,5-disubstituted-1,2,4-oxadiazoles with one of the substituents being 5-nitro-2-furyl. The compounds are useful as antibacterial, anthelmintic, and anti-trichomonas agents.

3,651,055

ANTHRAQUINONYL-TRIAZINE DYESTUFFS

Dennis Eckersley, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 18, 1970, Ser. No. 38,542
Claims priority, application Great Britain, July 4, 1969, 33,872/69
Int. Cl. C07d *51/42, 55/46*
U.S. Cl. 260—249 5 Claims

Anthraquinone dyes of the general formula:

A—T—Np—T—A

where each A represents a 1-amino-2-sulphoanthraquinon-4-ylaminoaryl moiety, Np represents a sulphonated 1,5- or 2,6-naphthylene radical and each T represents a chloro-s-triazine or chloro-5-cyanopyrimidine radical linked to A or to Np by a bridging amino group, are valuable reactive dyes for cellulose textiles giving a range of bright reddish-blue to green shades of excellent fastness to washing and to light. The dyes are notable for the high proportion which reacts with the fibre when applied from alkali- and salt-containing dyebaths in the beck or on the jig or winch.

3,651,056

TRIAZINE DERIVATIVES

Mitsuo Muruyama, Yokohama, Akira Okabe, Fujisawa, Hideo Yamazaki, Hideaki Sakai, Tadao Shimazu, and Shotaro Kajiya, Yokohama, and Katsunobu Noda, Kamakura, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

No Drawing. Filed Dec. 24, 1969, Ser. No. 888,040
Int. Cl. C07d *55/20*
U.S. Cl. 260—249.8 8 Claims

This invention is to provide novel 2,4-diamino-6-(OH-substituted alkoxy)-s-triazine compounds and bis(2,4-diamino-s-triazine-6-yl-oxy)-alkylene compounds which are useful as nonfoaming stabilizers for an aqueous solution of formaldehyde.

3,651,057

NITROFURFURALDEHYDE SULFONYLHYDRAZONES

Frederick K. Kirchner, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Filed May 21, 1969, Ser. No. 826,685
Int. Cl. C07d 5/30
U.S. Cl. 260—240 A 6 Claims

A series of 5-nitro-2-furaldehyde benzene-, α-toluene-, halobenzene- and alkylbenzenesulfonylhydrazones, useful for preventing and suppressing coccidiosis in poultry, are prepared by the condensation of 5-nitrofuraldehyde with the appropriate sulfonylhydrazide.

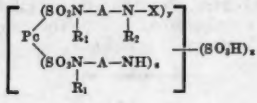
3,651,058

PHTHALOCYANINE DYESTUFFS

Victor David Poole, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 7, 1968, Ser. No. 774,199
Claims priority, application Great Britain, Nov. 23, 1967, 53,401/67
Int. Cl. C07d 55/18, 57/00
U.S. Cl. 260—242 7 Claims

The invention provides phthalocyanine dyestuffs of the formula:



wherein

Pc represents a phthalocyanine nucleus,

A represents an alkylene radical which may be substituted

X represents a s-triazine nucleus carrying at least one cellulose-reactive halogen atom or a pyrimidine nucleus carrying at least one cellulose-reactive halogen atom or methane sulphonyl group,

one of R_1 and R_2 represents a sulphatoalkyl group and the other represents a hydrogen atom or sulphatoalkyl group,

x has a value of 0 to 2, and y and z have values of from 1 to 3, the sum of the substituents attached directly to the phthalocyanine nucleus benig not greater than 4.

These dyestuffs are distinguished by the unusually high percentage which fixes on the cellulose during the dyeing or printing process.

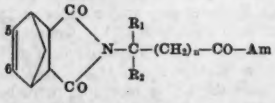
3,651,059

DERIVATIVES OF NORBORNENE-2,3-DICARBOXYIMIDE AND OF NORBORNANE-2,3-DICARBOXYIMIDE AND METHOD FOR PREPARING THEM

Enrico Serino and Demetrio Antoniu, Rome, Mario Magi, Siena, and Fabrizio Ganzina and Fabio Samueli, Rome, Italy, assignors to S.I.R. Laboratori Chimico-Biologici S.p.A., Tor Sapienza, Rome, Italy

No Drawing. Filed June 26, 1969, Ser. No. 836,994
Claims priority, application Italy, July 2, 1968, 18,510/68
Int. Cl. C07d 27/52
U.S. Cl. 260—247.2 A 13 Claims

A new series of Δ^5-norbornene-2,3-dicarboximide derivatives of the general formula:



(1)

and 5,6-dihydroanalogs are disclosed, and processes for their preparation.

3,651,060

1,1'-ETHYLENE-2,2'-BIPYRIDLIUM SALTS

George Henry Lang, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,370
Claims priority, application Great Britain, Oct. 4, 1968, 47,224/68
Int. Cl. C07d 51/76
U.S. Cl. 260—250 R 5 Claims

Herbicidal 1,1'-ethylene-2,2'-bipyridylium salts are obtained from 2,2'-bipyridyls by heating with an acid in ethylene glycol.

3,651,061

2,3-DIHYDRO-2-(1-NAPHTHYL)-4(1H)QUINAZOLINONE AND THE 6-CHLOROANALOG

Ronald J. Ericsson, Kalamazoo, Mich., and Ernst Reif, Heidenheim an der Brenz, Germany, assignors to Ernst Reif, Heidenheim an der Brenz, Germany

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,267
Int. Cl. C07d 51/48
U.S. Cl. 260—251 QA 2 Claims

2,3 - dihydro - 2 - (1-naphthyl) - 4(1H)quinazolinone and the 6 - chloroanalog are provided by this invention. These compounds are useful in controlling fertility in warm-blooded male animals.

3,651,062

BICYCLIC AMINES

Willy Fatzer, Flurweg 12, Bottmingen, Switzerland; Daniel Porret, Zeigerweg 37, Binningen, Switzerland; and Juerg Maurer, Baeumlihofstrasse 395, Riehen, Switzerland

No Drawing. Filed May 4, 1970, Ser. No. 34,534
Claims priority, application Switzerland, May 13, 1969, 7,287/69
Int. Cl. C07d 57/12
U.S. Cl. 260—256.4 F 5 Claims

Process for the manufacture of new, bicyclic amines, for example 1-(γ-aminopropyl)-9,9-dimethyl-1,3,7-triazabicyclo[4.3.0]non(7)en-2-one or 1-(γ-aminopropyl)-9-methyl-9-ethyl - 1,3,7 - triaza-bicyclo[4.3.0]non(7)en-2-one by intramolecular elimination of 1 mol of water from, for example, 1,3-di-(γ-aminopropyl)-5,5-dimethylhydantoin or 1,3 - di - (γ-aminopropyl)-5-methyl-5-ethylhydantoin. The new bicyclic amines represent valuable curing agents for epoxide resins, and furthermore a B-stage resin (precondensate) having good storage stability at room temperature can be manufactured.

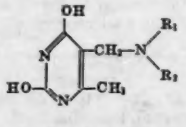
3,651,063

5-CYCLOHEXYLAMINO-6-METHYLURACIL

Masuro Murakami, Yuji Kawashima, and Noriki Ito, Tokyo, and Kuniichiro Yano, Saitama, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

No Drawing. Filed Oct. 16, 1968, Ser. No. 768,154
Claims priority, application Japan, Oct. 18, 1967, 42/66,520; June 10, 1968, 43/39,803
Int. Cl. C07d 51/30
U.S. Cl. 260—256.4 C 1 Claim

Novel 5-aminomethyl-2,4-dihydroxy-6-methyl pyrimidine derivatives of the general formula



wherein R_1 and R_2 are same or different and each represents a hydrogen atom, alkyl radical having 1 to 4 carbon atoms, cyclohexyl or aryl radical, and the said R_1 and R_2 may be taken together with the nitrogen atom to form a heterocyclic ring which may contain a further hetero

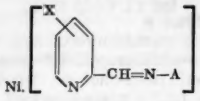
atom in the ring, with the proviso that R_1 and R_2 are not hydrogen atoms at the same time. The derivatives potentiate the efficiency of antibiotics such as chloramphenicol and josamycin. Compositions are provided comprising the said compound and an antibiotic.

3,651,064
PROCESS FOR PREPARING TERTIARY AMINE ALANES
Gunner E. Nelson, Warren E. Becker, and Paul Kobetz, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Original application Oct. 23, 1967, Ser. No. 677,088. Divided and this application Jan. 12, 1970, Ser. No. 2,392
Int. Cl. C07d *105/00*; C07f *5/06*
U.S. Cl. 260—270 R **17 Claims**

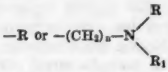
A process for preparing tertiary amine alanes by direct synthesis from hydrogen, an aluminum source, and a tertiary mono amine in the presence of a reaction promoter.

3,651,065
ZERO VALENT NICKEL COMPLEXES AND PREPARATION THEREOF
Yoshiharu Yagi, Ibaraki-shi, Osaka-fu, Akira Kobayashi, Nishinomiya-shi, Hyogo-ken, and Itsuro Hirata, Takatsuki-shi, Osaka-fu, Japan, assignors to Sumitomo Chemical Co., Ltd.
No Drawing. Filed Nov. 19, 1968, Ser. No. 777,151
Claims priority, application Japan, Nov. 21, 1967, 42/75,042; Jan. 19, 1968, 43/3,178
Int. Cl. C07f *15/04*
U.S. Cl. 260—270 **9 Claims**

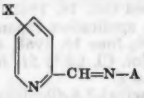
A nickel complex compound represented by the formula:



wherein X is a hydrogen atom or a non-dissociating substituent such as methyl or chlorine and A is a group of the formula:



in which R and R′ are each a hydrogen atom, a lower alkyl group, a cyclo(lower) alkyl group, an aryl group or an ar(lower)alkyl group and *n* is an integer of 2 or 3, which is prepared by treating an olefin coordinated complex of zero valent nickel with a Schiff base of the formula:



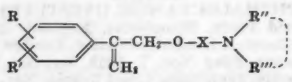
wherein X and A are each as defined above. The nickel complex is useful as a catalyst in oligomerization of butadiene and cooligomerization of the same in the presence of an α-olefin with a high selectivity.

3,651,066
POLYHALO-4-NITROSOPYRIDINES
Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Nov. 4, 1969, Ser. No. 874,064
Int. Cl. C07d *31/26*
U.S. Cl. 260—290 HL **4 Claims**

Disclosed as novel compounds are polyhalo-4-nitrosopyridines which may be substituted in the 6-position by cyano, trifluoromethyl or methylsulfonyl groups. The compounds have utility as pesticides and are variously effective as herbicides and as active constituents of fungicidal and bacteriocidal compositions.

3,651,067
STYRENE ETHERS OF AMINO ALCOHOLS
Bill Elpern, White Plains, and Victor T. Bandurco, Huntington Station, N.Y., assignors to USV Pharmaceutical Corporation
No Drawing. Filed Apr. 15, 1970, Ser. No. 28,985
Int. Cl. C07d *29/18*
U.S. Cl. 260—293.83 **4 Claims**

Compounds of the formula



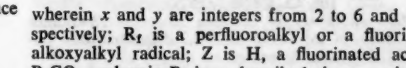
wherein X is a lower alkylene having from 2–5 carbon atoms, R and R′ are hydrogen, lower alkyl, lower alkoxy or halogen, R″ and R‴ are hydrogen, lower alkyl or phenyl lower alkyl, and R″ and R‴ taken together with N may be piperidino, morpholino, thiomorpholino, pyrrolidino, or methylpiperazino, are potent anticonvulsants, useful in the treatment of grand mal.

3,651,068
DERIVATIVES OF 1,2,3,4-TETRAHYDROBENZOTHIENO[2,3-c]PYRIDINES
John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 705,909, Feb. 16, 1968, now Patent No. 3,520,895, which is a continuation-in-part of application Ser. No. 621,475, Mar. 8, 1967. This application Nov. 13, 1969, Ser. No. 876,600
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 B **7 Claims**

The compounds are derivatives of 1,2,3,4 - tetrahydrobenzothieno[2,3 - C]pyridines and 1,2,3,4 - tetrahydro-5H - benzothieno[2,3 - C]azepines useful as tranquilizing and antihypertensive agents. Compounds disclosed are 2 - β - diethylaminopropyl - 1 - phenyl - 1,2,3,4 - tetrahydrobenzothieno[2,3 - C]pyridine and 1 - (p - chlorophenyl) - 1,2,3,4 - tetrahydrobenzothieno[2,3-C]pyridine.

3,651,069
FLUOROCARBON DERIVATIVES
Richard F. Sweeney, Randolph Township, Morris County, and Alson K. Price, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Aug. 1, 1968, Ser. No. 749,350
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 F **14 Claims**

Fluorinated quarternary ammonium salts having the formula



wherein *x* and *y* are integers from 2 to 6 and 1 to 4, respectively; R_f is a perfluoroalkyl or a fluorinated isoalkoxyalkyl radical; Z is H, a fluorinated acyl radical R_fCO— wherein R_f is as described above, a vinyl sulfone radical or a sulfone-tertiary amine adduct radical; Z′ is H, a fluorinated acyl radical R_fCO— wherein R_f is as described above, a vinyl sulfone radical, a sulfone-tertiary amine adduct radical, or a —C_xH_{2x}—NHZ radical wherein *x* and Z have the above meaning, there being at least one fluorinated acyl radical and one sulfone-tertiary amine adduct radical in the molecule represented by Z and Z′; X is an anion of a salt-forming acid; *q* is an integer cor-

responding to the number of sulfone-tertiary amine adduct radicals in the molecule; and *r* is an integer corresponding to the valency of X. These salts are water- and/or oil repellency agents for materials such as textiles and paper.

3,651,070
POLYCHLORO HYDROXY DERIVATIVES OF MONOCARBOXY PYRIDINES
Charles E. Granito, Cherry Hill, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio
No Drawing. Filed July 9, 1969, Ser. No. 840,535
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 R **2 Claims**

Novel polychloro hydroxy derivatives of monocarboxy and dicarboxy pyridines, their methods of preparation and utilization as pesticides are disclosed.

3,651,071
PYRIDINE DERIVATIVES AND THE PREPARATION THEREOF
Roy Dennis Bowden, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Mar. 6, 1969, Ser. No. 804,993
Claims priority, application Great Britain, Mar. 18, 1968, 13,008/68
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 D **13 Claims**

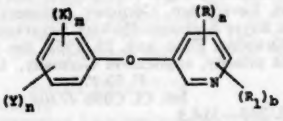
A process for the manufacture of bipyridyls which comprises reacting the corresponding substituted pyridine with ammonia in the vapous phase, the substituted pyridine being a 2-(pyridyl)tetrahydropyran or tetrahydrothiopyran, a 4-(pyridyl)tetrahydropyran or tetrahydrothiopyran, or a substituted pyridine wherein the substituent is a group of the structural formula

$$-C(R)(R_1)(R_2)$$

wherein R represents a hydrogen atom, a halogen atom, a hydroxy group, an alkyl group or an amino group, and R_1 and R_2 each represents a group of the general formula $-CH_n(XR_3)_{2-n}CH_m(XR_4)_{3-m}$ wherein X represents an atom of sulphur or oxygen, *n* is 0, 1 or 2 and *m* is 1 or 2, and R_3 and R_4 each represents a hydrogen atom or an alkyl, alkene, alkaryl, aralkyl or cyclo-aliphatic group.

3,651,072
3-(HALOPHENOXY) PYRIDINES
Kurt A. Nowotny, Camas, Wash., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 443,063, Mar. 26, 1965. This application Aug. 21, 1967, Ser. No. 661,782
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 **4 Claims**

Halogenated phenoxypyridines which can be represented by the formula



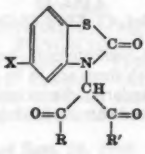
where X, Y, R and R_1 are each selected from the group consisting of fluoro, chloro and bromo; *m* and *n* are whole numbers from 0 to 5 and the sum of $m+n$ is from 0 to 5; *a* and *b* are whole numbers from 0 to 2 and the sum of $a+b$ is from 0 to 2; provided that the sum of $a+b+m+n$ is from 1 to 7; and mixtures thereof.

3,651,073
CERTAIN POLYFLUOROISOALKOXY-ALKOXY-METHYL PYRIDINIUM COMPOUNDS
Aziz Urrehman Kahn, Elizabeth, Alson Kay Price, Morristown, and Richard Francis Sweeney, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,012
Int. Cl. C07d *31/28*
U.S. Cl. 260—297 R **11 Claims**

Halomethyl ethers of polyfluoroisoalkyloxyalkyl alcohols characterized in that an ether oxygen links a fluorinated carbon atom attached to two fluoroalkyl groups and at least one $-CF_2-$ group. These compounds are useful as oil repellency agents and as intermediates for the preparation of their corresponding quaternary ammonium salts useful as oil and water repellency and surface active agents.

3,651,074
CERTAIN 2-OXO-3-BENZOTHIAZOLINYL-MALONYL COMPOUNDS
John Joseph D'Amico, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 24, 1969, Ser. No. 888,063
Int. Cl. C07d *91/24*
U.S. Cl. 260—304 **6 Claims**

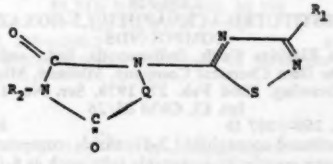
Compounds of the formula



where X is hydrogen or chlorine, and R and R′ are individually lower alkyl or lower alkoxy are disclosed. The new compounds are particularly useful as contact herbicides.

3,651,075
CERTAIN 2,4,5-TRIOXOIMIDAZOLINDIN-1-YL- AND 3,5 - DIOXO-1,2,4-THIADIAZOLIDIN-2-YL-1,2,4-THIADIAZOLES
Alfred H. Miller, Somerset, N.J., assignor to Esso Research and Engineering Company
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,463
Int. Cl. C07d *91/62*
U.S. Cl. 260—306.8 D **13 Claims**

Compositions of matter characterized by the following structural formula:



wherein R_2 can be one selected from the group consisting of hydrogen, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, C_7–C_{10} aralkyl, C_1–C_4 dialkyl amino, C_6–C_{10} aryl optionally substituted by C_1–C_4 alkyl, C_2–C_8 alkene, C_3–H_8 alkyne, chlorine, bromine or nitro; R_1 can be the same or different as R_2, and can also include C_1–C_4 alkylmercapto;

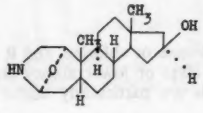
and Q is one selected from the group consisting of C=O and S, have been shown to possess pesticidal activity especially pre- and post-emergent herbicidal activity.

3,651,076
SULFUR COMPOUNDS AND METHODS FOR THEIR PRODUCTION
Roger D. Westland, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.
No Drawing. Filed Aug. 7, 1969, Ser. No. 848,343
Int. Cl. C07d *91/34*
U.S. Cl. 260—306.8 R 5 Claims

3-[(2-mercaptoethyl)amino] - N - 2-thiazolylpropionamide, 3,3'-[dithiobis(ethyleneimino)]bis[N-2-thiazolylpropionamide], and their acid-addition salts, useful as schistosomacides, and their production by (1) reaction of N-2-thiazolyl-1-ethyleneiminopropionamide with hydrogen sulfide to produce the thiol product and (2) reaction of the thiol product with an oxidizing agent to produce the disulfide product.

3,651,077
1,4-OXIDO-3-AZA-A-HOMO-STEROIDS AND PROCESS FOR THEIR MANUFACTURE
Oskar Jeger, Zollikerberg, Zurich, and Hans Ueli Wehrli, Schaffhausen, Switzerland, assignors to Ciba Corporation, New York, N.Y.
No Drawing. Filed Mar. 25, 1968, Ser. No. 715,496
Claims priority, application Switzerland, Mar. 31, 1967, 4,594/67
Int. Cl. C07d *85/26*
U.S. Cl. 260—307 F 10 Claims

1,4-oxido-3-aza-A-homosteroids represent a class of steroids among which there are to be found natural products, such as Samandarin, the principal alkaloid of the salamander skin gland extract, having the formula



Such a process comprises converting the aldehyde group in a 3-ether of a 1α-aldehydo-3-hydroxy-2-oxa-5α-steroid or of a 1β-aldehydo-3-hydroxy-2-oxa-5β-steroid into a free aminomethyl group and treating resulting compounds with an acid.

This compound and derivatives related to it, such as the new 1β,4β-oxido-3-aza-A-homosteroids of the androstane series can be prepared by the new process of the present invention. These new compounds have, like Samandarin, a local anaesthetic effect and they also increase the blood pressure.

3,651,078
8-SUBSTITUTED-ACENAPHTH(1,2-d)OXAZOLE COMPOUNDS
Herman Eldridge Faith, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Feb. 27, 1970, Ser. No. 15,255
Int. Cl. C07d *85/26*
U.S. Cl. 260—307 D 4 Claims

8-substituted-acenaphth(1,2-d)oxazole compounds and their pharmaceutically-acceptable salts, such as 8-(dimethylamino)-6b-9a-dihydroacenaphth(1,2 - d)oxazole hydrobromide are prepared by the reaction of 2-amino-1-acenaphthenol with a substituted organic nitrogen compound such as cyanogen bromide, diethyl carbamyl chloride, or propyl isocyanate. The novel compounds are useful as anoretic agents and are also useful as antimicrobials for the control of bacteria and fungi.

3,651,079
1-ARYL-5-HYDROXYALKYL-HYDANTOINS
Joseph A. Skorcz, Milwaukee, and John T. Suh, Mequon, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,750
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 7 Claims

The compounds are 1-aryl-5-hydroxyalkyl-hydantoins which are useful as central nervous system affecting agents and as intermediates in the preparation of pickling agents, moth-proofing agents and wood preservatives. Representative of the compounds disclosed are 5-hydroxymethyl-1-(2-methoxy-4-nitrophenyl) - 5 - methylhydantoin, 5-acetoxymethyl - 1 - (2-methoxy-4-nitrophenyl)-5-methylhydantoin, 5 - acetoxymethyl - 1 - (2-methoxy-4-aminophenyl)-3,5-dimethylhydantoin hydrochloride and 5-hydroxymethyl - 1 - (2-methoxy - 4 - aminophenyl)-5-methylhydantoin hydrochloride.

3,651,080
CERTAIN SUBSTITUTED 2-ALKYLMERCAPTO-IMIDAZOLE DERIVATIVES
Karl J. Doebel, Ossining, N.Y., and Andre R. Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation
No Drawing. Continuation-in-part of application Ser. No. 721,930, Apr. 17, 1968, which is a continuation-in-part of application Ser. No. 500,245, Oct. 21, 1965. This application Nov. 7, 1969, Ser. No. 874,949
The portion of the term of the patent subsequent to Apr. 7, 1987, has been disclaimed
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 6 Claims

The compounds are of the class of substituted 2-alkylmercaptoimidazole derivatives which have anti-inflammatory utility. An illustrative example is 1-(4-methoxyphenyl)-2-methylmercapto-5-methylimidazole.

3,651,081
PRODUCTION OF 2-ARYL-3-AMINOINDAZOLES
Hans-Juergen Sturm, Ludwigshafen (Rhine), and Herbert Armbrust, Gruenstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed July 29, 1968, Ser. No. 748,210
Claims priority, application Germany, Aug. 2, 1967, P 16 70 255.9
Int. Cl. C07d *49/02*
U.S. Cl. 260—310 C 6 Claims

A process for the production of 2-substituted indazoles from ortho-azobenzonitriles by reaction with dithionites.

3,651,082
PROCESS FOR THE PRODUCTION OF HALOGEN-CONTAINING COBALT-PHTHALOCYANINE DERIVATIVES
Peter Mertens, Cologne-Marienburg, and Heinrich Vollmann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Aug. 28, 1968, Ser. No. 755,825
Claims priority, application Germany, Aug. 31, 1968, F 53,374
Int. Cl. C09b *47/04*
U.S. Cl. 260—314.5 11 Claims

Cobalt phthalocyanine complex compounds having one or more halogen atoms linked directly to the cobalt atom are prepared by reacting a cobalt phthalocyanine dispersed in an organic liquid free of hydroxy and amino groups and inert to the reactant with a halogenating agent.

3,651,083

TETRA- AND HEXAHYDRO-PHENYLPYRROLO BENZODIAZEPINES AND INTERMEDIATES

Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,691
Int. Cl. C07d *53/02, 53/06*
U.S. Cl. 260—326.5 B 13 Claims

1,2,4,5 - tetrahydropyrrolo[3,2,1 - jk][1,4]benzodiazepines, 1,2,4,5,6,7-hexahydro-7-phenylpyrrolo[3,2,1-jk][1,4]benzodiazepines, 4,5,6,7-tetrahydro-7-phenylpyrrolo[3,2,1-jk][1,4]benzodiazepines, 1,2,4,5,6,7 - hexahydro - 6-phenylpyrrolo[1,2,3-ef][1,5]benzodiazepines and processes for preparing the same. The novel benzodiazepines exhibit tranquilizing and anticonvulsant activity in animals.

3,651,084

SUBSTITUTED PHENYLALKANOIC ACIDS

Rolf Denss, Basel, Switzerland, Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,393
Claims priority, application Switzerland, Apr. 29, 1968, 6,379/68
The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed
Int. Cl. C07d *27/24*
U.S. Cl. 260—326.3 5 Claims

The compounds are of the class of [4-(1-pyrryl)-phenyl]-alkanoic acid and the pharmaceutically acceptable salts thereof and have analgesic and anti-inflammatory activity; the compounds are active ingredients of pharmaceutical compositions and are useful for alleviating pain and treating inflammatory diseases in mammals; an illustrative embodiment is 4-[4-(1-pyrryl)-3-chlorophenyl]-butyric acid.

3,651,085

1-(ω-BENZOYLALKYL)-3-SUBSTITUTED PYRROLIDINES

Carl Dalton Lunsford, William John Welstead, Jr., and Grover Cleveland Helsley, Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Continuation-in-part of application Ser. No. 592,263, Nov. 7, 1966. This application Apr. 14, 1969, Ser. No. 816,119
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.5 J 9 Claims

Novel 1-(ω-benzoylalkyl)-3 - substituted pyrrolidines possessing central nervous system depressant activity and analgetic activity are disclosed. The compounds are prepared from γ-halobutyrophenones, β-(di-lower alkylamino)propiophenones and 3-substituted pyrrolidines.

3,651,086

5-AMINOMETHYL-4,5,6,7-TETRAHYDRO-4-OXOINDOLES

Irwin J. Pachter, 42 Juneau Blvd., Woodbury, N.Y. 11797, and Karl Schoen, 83—36 Beverly Road, Kew Gardens, N.Y. 11415

No Drawing. Application Sept. 1, 1967, Ser. No. 664,942, which is a continuation of applications Ser. No. 575,303, Aug. 26, 1966, and Ser. No. 599,387, Dec. 6, 1966. Divided and this application July 15, 1968, Ser. No. 768,566
Int. Cl. C07d *27/54*
U.S. Cl. 260—326.15 4 Claims

Process for preparing 2-aminoalkyl pyrrol-3-yl ketones and derivatives thereof, and oxoindoles thus produced. The process is carried out by quaterizing 2-dimethylamino- or 2-piperidino-alkyl-pyrrol-3-yl ketones or derivatives thereof, including those having bi- and tricyclic nuclei, and reacting the quaternary salts either with a base and an amine or, alternatively, with an amine only.

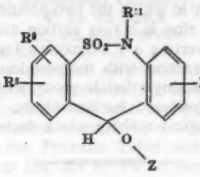
3,651,087

DIBENZOTHIAZEPINE ETHER INTERMEDIATES

Abraham Weber, Paris, and Jacques Jean Frossard, Champigny, France, assignors to Mead Johnson & Company

No Drawing. Original application Aug. 3, 1967, Ser. No. 657,785, now Patent No. 3,519,633, dated July 7, 1970. Divided and this application Mar. 18, 1970, Ser. No. 18,774
Int. Cl. A61k *27/00*; C07d *93/42*
U.S. Cl. 260—327 B 4 Claims

Novel compounds of Formula I having antihistaminic and other pharmacological activity



Formula I

This invention is concerned with a novel group of chemical substances having antihistaminic and other pharmacologic activities, and intermediates for their preparation.

3,651,088

CERTAIN ANILINOALKYL MERCAPTANS AS FUNGICIDES

Asbjorn Baklien, Kingsbury, Victoria, and Jocelyn Margaret Gregory, Croydon, Victoria, Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,975
Claims priority, application Australia, Oct. 31, 1967, 29,186/67
Int. Cl. A01n *9/20*
U.S. Cl. 424—330 6 Claims

Fungicidal compositions containing as the active ingredient certain anilinoalkyl mercaptans. The compositions are useful for controlling bunt, smut, Tilletia spp. and other fungi.

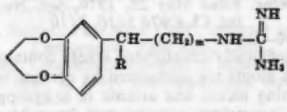
3,651,089

BENZODIOXEPINE DERIVATIVES OF GUANIDINE

Darius Molho, Boulogne-sur-Seine, Eugene Boschetti, Venissieux, and Louis Fontaine, Lyon, France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique

No Drawing. Original appplication Feb. 21, 1967, Ser. No. 617,463, now Patent No. 3,502,695, dated Mar. 24, 1970. Divided and this application Oct. 29, 1969, Ser. No. 870,933
Claims priority, application France, Feb. 28, 1966, 51,313; Nov. 22, 1966, 84,498
Int. Cl. C07d *13/00*
U.S. Cl. 260—340.3 6 Claims

The benzodioxepine derivatives of guanidine of the formula



in which *m* is equal to 0 or 1 and R is a member of the group formed by hydrogen and the hydroxy radical, and their acid addition salts, useful as hypotensive agents.

3,651,090

1,3-DIOXOLAN-4-YL-ALKYL GUANIDINES

Waldo R. Hardie, Walnut Creek, and Joseph E. Aaron, Berkeley, Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

No Drawing. Application June 17, 1969, Ser. No. 834,174, now Patent No. 3,547,951, which is a continuation-in-part of application Ser. No. 547,194, May 3, 1966. Divided and this application Dec. 17, 1969, Ser. No. 888,118

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 12 Claims

1,3-dioxolan-4-yl-alkyl-guanidines substituted at the two-position of the dioxolane ring with hydrogen, alkyl, substituted alkyl, a carbocyclic ring system, or a spirocyclic ring system in which the two-position carbon atom of the dioxolane ring is a ring carbon atom thereof, are prepared by converting a 1,3-dioxolan-4-yl-alkylamine to a guanidine by reaction with thiopseudourea. The amine is prepared by reacting a halide group with a metallo salt of phthalimide followed by hydrolysis. The guanidines have pharmacological activity which includes anti-hypertensive activity.

3,651,091

DERIVATIVES OF 4-HYDROXY COUMARIN AND THE PREPARATION THEREOF

Eugene Boschetti, Venissieux, Darius Molho, Boulogne-sur-Seine, and Louis Fontaine, Lyon, France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique

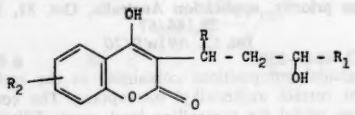
No Drawing. Continuation-in-part of application Ser. No. 689,347, Dec. 11, 1967, now Patent No. 3,574,234. This application Nov. 21, 1969, Ser. No. 878,876

Claims priority, application France, Dec. 13, 1966, 87,213; Nov. 13, 1967, 127,915; Nov. 28, 1968, 175,753

Int. Cl. C07d *7/30*

U.S. Cl. 260—343.2 R 13 Claims

The 4-hydroxy coumarins are represented by the formula



in which R is a member of the group formed by hydrogen, the phenyl, halophenyl, dihalophenyl, nitrophenyl, methoxypenyl, tolyl, methylene dioxyphenyl and furyl radicals;

R_1 is a member of the group formed by the methyl, phenyl, halophenyl, nitrophenyl, diphenyl, halodiphenyl, nitrodiphenyl and naphthyl radicals; and

R_2 is hydrogen or a halogen.

These new 4-hydroxy coumarins have very powerful oral anticoagulating actions of the antivitamin K type.

3,651,092

ISOMERIZATION PROCESS

Paul R. Stapp, Gerhard P. Nowack, and Marvin M. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed May 25, 1970, Ser. No. 40,343

Int. Cl. C07d *5/10, 7/10*

U.S. Cl. 260—345.1 24 Claims

Cyclic olefinically unsaturated ethers containing 4 to 5 ring carbon atoms are isomerized by contact with a catalyst containing nickel and arsenic in a hydrogen atmosphere. The isomerization reaction is favorably influenced by the presence of carbon monoxide. The isomerization products are useful solvents and intermediates for the preparation of useful chemicals such as polymers, polyfunctional alcohols and the like.

3,651,093

BIS-TETRAHYDROPYRANYL SULFIDE

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Dec. 13, 1968, Ser. No. 783,737

Int. Cl. C07d *7/46*

U.S. Cl. 260—345.9 2 Claims

Novel bis-tetrahydropyranyl sulfides are prepared by reacting a halo-tetrahydropyran with an alkali metal or an alkaline earth metal sulfide. Bis-tetrahydropyranyl sulfones and sulfoxides can be prepared by oxidizing the bis-tetrahydropyranyl sulfide with hydrogen peroxide.

3,651,094

2,3-DIHYDRO-5-ACYLBENZOFURAN-2-CARBOXYLIC ACIDS

Bernard Libis, St. Louis-la-Chaussee, France, and Ernst Habicht, Oberwil, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed May 26, 1969, Ser. No. 827,941

Claims priority, application Switzerland, May 30, 1968, 8,030/68

Int. Cl. C07d *5/36*

U.S. Cl. 260—346.2 5 Claims

5-acyl-benzofuran-2-carboxylic, 5-acyl-benzothiophene-2-carboxylic acids and pharmaceutically acceptable salts thereof with bases, which compounds have valuable diuretic and simultaneously saluretic as well as anti-tussive activities, therapeutic compositions containing such compounds as aforesaid or their pharmaceutically acceptable salts with bases as well as methods for producing simultaneously diuretic and saluretic effects and for inhibiting tussive irritation in mammals. Illustrative embodiments exhibiting primarily antitussive and simultaneous diuretic and saluretic effects respectively are 2,3-dihydro-5-butyryl-6-methyl-benzofuran-2-carboxylic acid and 2,3-dihydro-5-butyryl-6,7-dimethylbenzofuran-2-carboxylic acid.

3,651,095

PROCESS FOR THE PURIFICATION OF TRIMELLITIC ANHYDRIDE

Gerhard Jung, Cologne-Weidenpesch, and Gerhard Klotgen, Essen, Germany, assignors to Chemiebau Dr. A. Zieren G.m.b.H. & Co. KG, Cologne-Mungersdorf, Germany

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,970

Claims priority, application Germany, Oct. 24, 1967, P 16 43 816.7

Int. Cl. C07c *63/02, 63/32*

U.S. Cl. 260—346.4 13 Claims

A process for the continuous purification of crude trimellitic anhydride obtained by an oxidation process, such as the nitric acid oxidation of 1,2,4-trialkyl benzene and subsequent anhydride formation by distillation at elevated temperatures under a vacuum, wherein molten, crude trimellitic anhydride is distributed in a thin film and subjected to distillation conditions for a period of less than 120 seconds under a pressure of about 3 to 30 torr (millimeters of mercury), and at a temperature of between about 205 and 270° C.

3,651,096

PREPARATION OF DIETHYL TETRAHYDROFURFURYLMALONATE

Nicholas D. Harris, Norwich, N.Y., assignor to The Norwich Pharmacal Company

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,897

Int. Cl. C07d *5/04*

U.S. Cl. 260—347.5 1 Claim

Diethyl tetrahydrofurfurylmalonate is conveniently prepared by the hydrogenation of diethyl furfurylidenemalonate in the presence of palladium on carbon.

3,651,097

SYNTHESIS OF 2-METHYL AND 2-ETHYL-3-HYDROXY - 4,5 - DIHYDROFURAN-4-ONE FROM MONOSACCHARIDE 5-ESTERS

Godefridus Antonius Maria van den Ouweland and Hendricus Gerardus Peer, Zevenaar, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Mar. 11, 1969, Ser. No. 806,290
Claims priority, application Luxembourg, Mar. 10, 1968, 55,706; Dec. 23, 1968, 57,648
Int. Cl. C07d *5/10;* A23l *1/26*
U.S. Cl. 260—347.8 9 Claims

Certain 2-alkyl-3-hydroxy-4,5-dihydrofuran-4-ones useful as flavouring agents, particularly in meaty flavours can be prepared from monosaccharide 5-esters. The phosphate esters are particularly useful as starting materials. The monosaccharide 5-esters are reacted with nucleophillic agents, such as diethylamine, in an aqueous medium at a carefully controlled pH between 2 and 8 preferably in the presence of a buffer system.

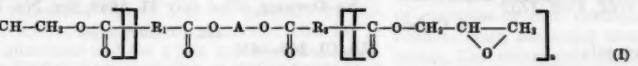
3,651,098

POLYGLYCIDYL ESTERS

Alfred Heer, Birsfelden, and Karl Metzger, Aesch, Basselland, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,749
Claims priority, application Switzerland, Jan. 29, 1968, 1,314/68
Int. Cl. C07d *1/18*
U.S. Cl. 260—348 A 11 Claims

Polyglycidyl esters of formula



(I)

wherein R_1 and R_2 independently of each other denotes a residue, obtained by removal of the carboxyl groups, or an aliphatic or cycloaliphatic polycarboxylic acid having 2 to 4 carboxyl groups, A represents the residue, obtained by removal of the two hydroxyl groups, of a polyalkylene glycol of average molecular weight of at least 200, and wherein *m* and *n* denote integers having a value of at least 1 and at most 3, preferably 1 or 2.

3,651,099

PREPARATION OF MONOBENZAMIDO DERIVATIVES OF DIAMINOANTHRAQUINONE

Hans L. Perlinger, Toms River, and Joseph S. Milazzo, Dumont, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Apr. 2, 1968, Ser. No. 718,198
Int. Cl. C09b *1/42*
U.S. Cl. 260—377 14 Claims

A process for producing monoacylated derivatives of diaminoanthraquinones comprising reacting the diaminoanthraquinone with benzoyl chloride or a mixture of benzoic acid and an inorganic acid chloride in the presence of an N,N-dialkyl carboxylic acid amide.

3,651,100

5β-H-6-KETO-PREGNANE DERIVATIVES

Andor Fürst and André Furlenmeier, Basel, Albert Langemann, Binningen, and Guy Waldvogel, Riehen, Switzerland, and Peter Hocks, Ulrich Kerb, and Rudolf Wiechert, Berlin, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Aug. 9, 1966, Ser. No. 571,187. Divided and this application Feb. 29, 1968, Ser. No. 709,186
Claims priority, application Germany, Oct. 15, 1965, Sch 37,892; Jan. 27, 1966, Sch 38,384; Switzerland, Mar. 24, 1966, 4,336/66
Int. Cl. C07c *173/00*
U.S. Cl. 260—397.4 6 Claims

This invention is directed to 2,3-substituted 5β-H-6-keto-pregnane derivatives which are useful as metamorphosis hormones and are additionally useful as intermediates for the production of other insect hormones. Accordingly, the compounds may be employed in the control of insect population.

3,651,101

PROCESS FOR THE MANUFACTURE OF PHENYL ESTERS AND PHENOL FROM BENZENE

Manfred Boldt and Hans-Jürgen Arpe, Fischbach, Taunus, and Lothar Hornig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 9, 1968, Ser. No. 751,351
Claims priority, application Germany, Sept. 12, 1968, P 16 43 355.9
Int. Cl. C07c *67/04*
U.S. Cl. 260—410.5 12 Claims

The invention provides a process for the catalytic preparation of phenyl esters and, if desired, phenol from benzene and saturated aliphatic carboxylic acids in the presence of a catalyst comprising a noble metal of subgroup VIII of the Periodic Table and carboxylates of metals of Group II*b*, III or IV of the Periodic Table.

3,651,102

PREPARATION OF DIESTERS

Myron Coopersmith, New York, N.Y., assignor to Esso Research and Engineering Company

No Drawing. Filed May 1, 1967, Ser. No. 634,838
Int. Cl. A61k *7/14;* C11c *3/00*
U.S. Cl. 260—410.6 6 Claims

Glycol monoesters prepared by the reaction of hindered acids with alkylene oxides are converted to alkyl diesters and ether alkyl diesters in acid or base catalyzed reactions. The diesters are useful as emollients having good hydrolytic stability, and which do not suppress foam.

3,651,103

SUBSTITUTED 2-(FLUOREN - 2-YLOXY)-ACETIC ACIDS AND LOWER ALKYL ESTERS THEREOF

Gerhard Baschang, Bettingen, Charles J. Morel, Arlesheim, and Oskar Wacker, Binningen, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Sept. 24, 1969, Ser. No. 860,827
Claims priority, application Switzerland, Sept. 25, 1968, 14,335/68
Int. Cl. C07c *69/76;* C11c *3/00*
U.S. Cl. 260—413 3 Claims

Compounds of the class of substituted 2-(fluoren-2-yloxy)- and 2-(fluoren-2-ylthio)-acetic acids, as well as lower alkyl esters and alkali and alkaline-earth metal salts thereof have hypolipemic activity; they are active ingredients of pharmaceutical compositions and are useful for treating hyperlipemic conditions in warm-blooded animals.

3,651,104

α,β-UNSATURATED QUATERNARY ALKYLATED FATTY ACIDS AND ESTERS USEFUL FOR INSECT CONTROL

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 854,778, Sept. 2, 1969. This application Oct. 27, 1969, Ser. No. 869,855
Int. Cl. C07c *69/52;* A01n *9/24*
U.S. Cl. 260—410.9 R 13 Claims

Methods employing and compositions comprising a quaternary alkylated aliphatic hydrocarbon amide or ester and derivatives thereof for the control of insects.

3,651,105

CHROMIUM COMPLEXES OF FLUOROISO-ALKOXYALKYL CARBOXYLIC ACIDS

Louis G. Anello, Basking Ridge, Edward Michael Boghosian, Fort Lee, Edward S. Jones, Whippany, Pritam S. Minhas, Morris Plains, Alson K. Price, Morristown, and Richard F. Sweeney, Randolph Township, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,849

Int. Cl. C08h *17/36*

U.S. Cl. 260—414 7 Claims

Chromium complexes of fluorocarbon carboxylic acids characterized by having a polyfluoroisoalkoxyalkyl tail wherein an ether oxygen atom links a fluorinated carbon atom connected to two fluoroalkyl groups and at least one —CF_2CF_2-group. These chromium complexes are useful to impart oil and water resistance to various substrates, including paper, leather, and the like.

3,651,106

PREPARATION OF 2-(6-METHOXY-2-NAPHTHYL) PROPIONIC ACID, -1-PROPANOL, AND PROPANAL AND INTERMEDIATES THEREFOR

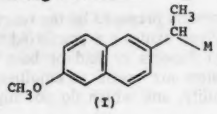
Ian T. Harrison, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Sept. 30, 1969, Ser. No. 862,501

Int. Cl. C07f *3/08, 3/02, 1/02*

U.S. Cl. 260—429 R 4 Claims

Compounds having the formula



(I)

are carboxylated to yield the corresponding 2-(6-methoxy-2-naphthyl)propionic acid; carbonylated to yield the corresponding 2-(6-methoxy-2-naphthyl)propanal, or carbinolated to yield the corresponding 2-(6-methoxy-2-naphthyl)-1-propanol. In the formula M represents —MgX (X=Cl, Br, I), Li, Na, K, $Zn_{1/2}$, $Cd_{1/2}$, and the like. The products have anti-inflammatory, analgesic and anti-pyretic activities.

3,651,107

ORGANOTIN SALTS OF MONOALKYL ALKENYLSUCCINATES

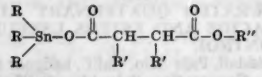
Robert J. Stanback, Gladstone, and Thomas E. Maggio, Somerville, N.J., assignors to Tenneco Chemicals, Inc.

No Drawing. Filed Oct. 14, 1969, Ser. No. 866,366

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 7 Claims

Organotin compounds that have the structural formula



wherein each R represents phenyl or an alkyl group having from 4 to 12 carbon atoms; one R′ represents an alkenyl group having from 8 to 22 carbon atoms; the other R′ represents hydrogen; and R″ represents an alkyl group having from 1 to 16 carbon atoms are used to protect surface-coating compositions from attack by microorganisms. Among the most effective of these biocidal compounds is (tri-n-butyltin)-n-butyldodecenylsuccinate.

3,651,108

PROCESS FOR THE PREPARATION OF TIN-ALKYLS

Bindo Massimo Giannaccari, Rome, and Riccardo Galli, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed May 14, 1970, Ser. No. 37,287

Claims priority, application Italy, May 20, 1969, 17,020/69

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 11 Claims

A process is disclosed for preparing tin-alkyls starting from metallic tin and alkyl halides, characterized in that a mixture of subdivided tin and an auxiliary subdivided alkali or alkaline earth metal is reacted with an alkyl halide in the presence of a catalyst selected from the class consisting of onium salts and Lewis bases or mixtures thereof, at a temperature between 0 and 150° C. The onium salts are tetra-alkylammonium halides and the Lewis bases are ethers, thioethers and amines.

3,651,109

PROCESS FOR PREPARING ORGANOMERCURY COMPOUNDS

Ronald D. Clark, North Randall, and Ronald J. Valus, Cleveland, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

No Drawing. Filed July 31, 1969, Ser. No. 846,598

Int. Cl. C07f *3/10*

U.S. Cl. 260—431 7 Claims

Organomercury compounds can be prepared in essentially theoretical yields by reacting an organomercuric halide with magnesium metal in the presence of carbon dioxide.

3,651,110

NICKEL DERIVATIVES OF SALICYLIC ACID ESTERS AND A PROCESS FOR PREPARING THE SAME

Laird Gordon Lindsay Ward, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,618

Int. Cl. C07f *15/04;* C08f *45/62*

U.S. Cl. 260—439 R 9 Claims

Nickel derivatives of salicylic acid esters, e.g., anhydrous nickel-2-carbmethoxyphenoxide, and a process for preparing the same in which a salicylic acid ester such as methylsalicylate, a Group Ia metal alkoxide and a nickel salt are reacted in an essentially non-aqueous environment, and the nickel derivative is precipitated from solution. Anhydrous nickel-2-carbmethoxyphenoxide prepared by this process is effective as a light stabilizing additive in polymers such as polyvinylchloride.

3,651,111

AMIDE-NICKEL SALT COMPLEXES

Howard E. Dunn, Mount Vernon, Ind., assignor to Phillips Petroleum Company

No Drawing. Filed Oct. 7, 1969, Ser. No. 864,564

Int. Cl. C07f *75/04;* C07c *3/10*

U.S. Cl. 260—439 R 2 Claims

Amide-nickel salt complexes having constituents of substituted 2-aminomalonamides and nickel salts are produced, which complexes are useful as a catalyst in the

oligomerization of monoolefins. Bis[N,N'-dicyclohexyl-2 - (cyclohexylamino)malonamide] reacts with nickel chloride to form bis[N,N' - dicyclohexyl - 2 - (cyclohexylamino)malonamide]dichloronickel, which is used as an oligomerization catalyst for propylene.

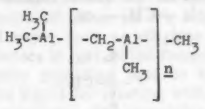
3,651,112

POLYMERIC ORGANO ALUMINUM SUBSTANCES

Hansjoerg Sinn, Harksheide, Helmut Hinck and Hans Friedrich Gruetzmacher, Hamburg, and Friedhelm Bandermann, Schenefeld, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 8, 1968, Ser. No. 765,995
Claims priority, application Germany, Oct. 12, 1967, P 17 20 313.3
Int. Cl. C08g *33/20*; C07f *5/06*
U.S. Cl. 260—448 A **2 Claims**

A new polymeric organo aluminum substance is described; it has essentially the structural formula:



wherein *n* denotes an integer of at least 2, the upper limit being practically infinity. The substance and branched derivatives thereof may be prepared by dissolving bicyclopentadienyltitanomonomethyl chloride in trimethyl aluminum and the whole kept thermostatically at −50 to 200° C. while excluding oxygen and water and evolving methane.

3,651,113

COMPLEXES OF ALUMINUM TRICHLORIDE OR BORONTRIFLUORIDE WITH HYDROQUINONE AND PREPARATION THEREOF

Werner Metlesics, Vienna, Austria, and Pius Anton Wehrli, Verona, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 777,199, Nov. 19, 1968, which is a continuation-in-part of application Ser. No. 708,495, Feb. 27, 1968. This application Feb. 5, 1969, Ser. No. 796,911
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 R **10 Claims**

A process for producing chromanols by the reaction of an isoprenol or isoprenol derivatives and a hydroquinone in the presence of borontrifluoride or aluminum trichloride and intermediates in this process.

3,651,114

PRODUCTION OF ORGANO ALUMINUM COMPOUNDS

Hoyt J. Cragg and Kenneth L. Lindsay, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,888
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 A **9 Claims**

Improvements in reactions for producing organo aluminum compounds are described. The improvements involve control of the proportions of reactants fed for reactions involving aluminum, olefin and hydrogen in the presence of an organo aluminum compound. It is disclosed that significantly increased reaction rates are obtained when olefin and hydrogen are fed at a ratio substantially higher than the 2:1 molar ratio taught as suitable or even unimportant by much of the prior art.

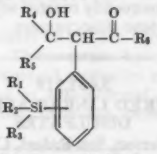
3,651,115

ORGANO-SILICON-CONTAINING ALPHA-PHENYL-BETA-HYDROXY-CARBOXYLIC ACIDS

Igal Belsky, Ramat-Gan, and David Gertner and Albert Zilkha, Jerusalem, Israel, assignors to Yissum Research Development Company, Hebrew University, Jerusalem, Israel

No Drawing. Filed May 18, 1967, Ser. No. 639,301
Claims priority, application Israel, May 22, 1966, 25,820
Int. Cl. C07f *7/10*
U.S. Cl. 260—448.2 N **10 Claims**

Compounds of the formula



wherein R_1, R_2, and R_3 are alkyl or aryl; R_4 and R_5 are hydrogen, alkyl, aryl or aralkyl, or form together with the adjoining carbon atom carrying the hydroxyl group a cyclohexyl, cyclopentyl or cycloheptyl group; and R_6 is hydroxyl, a residue of an alcohol connected through its hydroxyl group to the carbonyl group by an ester linkage and containing a tertiary amino group and having an alkyl or cycloalkyl or heterocyclic or a condensed biheterocyclic skeleton, or is a residue of any of ammonia, hydroxylamine, hydrazine, N-alkyl or aryl substituted hydrazine, a primary of secondary amine, urea, thiourea of guanidine or their substituted derivatives, all of such residues being connected through nitrogen to the C=O group. The compounds display anti-cholinergic activity and are antidotal against organo-phosphate poisoning.

3,651,116

SILYLATED PROSTAGLANDIN F_α ACIDS AND ESTERS

Frank H. Lincoln, Jr., Portage, and John E. Pike, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 873,603, Nov. 3, 1969. This application Aug. 4, 1970, Ser. No. 60,928
Int. Cl. C07f *7/04, 7/18*
U.S. Cl. 260—448.8 R **22 Claims**

Prostaglandin F_α acids and esters are obtained in improved yields with respect to the usual byproduct prostaglandin F_β acids and esters by silylating corresponding prostaglandin E compounds, reducing the silylated prostaglandin E compounds to silylated prostaglandin F compounds, and then removing the silyl groups by hydrolysis.

3,651,117

ESTERIFICATION OF HALOSILANES

Everett W. Bennett, Longmeadow, Mass., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 8, 1970, Ser. No. 70,053
Int. Cl. C07f *7/04, 7/06, 7/18*
U.S. Cl. 260—448.8 R **15 Claims**

A process for esterifying halosilanes which comprises mixing a halosilane and a sufficient amount of an alcohol in a reaction zone wherein at least 80 percent of the halogen groups of the halosilane are esterified by reaction with said alcohol, said reaction zone having a temperature sufficiently high enough to maintain said halosilane, alcohol, and the highest boiling esterified silane reaction product in the vapor state, and removing the products of the reaction from the reaction zone while in the vapor state.

3,651,118

PROCESS FOR THE PREPARATION OF 1,3-CYCLOHEXYLENE DIISOCYANATES

Moses Cenker, Trenton, and Peter T. Kan, Livonia, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,934

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PH 13 Claims

A process for the preparation of 1,3-cyclohexylene diisocyanates in which 1,3-cyclohexanediamines are contacted with hydrogen chloride to form dihydrochloride salts which are subsequently reacted with phosgene to provide 1,3-cyclohexylene diisocyanates.

3,651,119

SULFUR-LINKED LINEAR ALKYL VICINAL DISULFATES

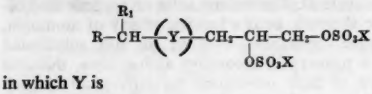
Robert G. Anderson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Aug. 5, 1970, Ser. No. 62,233

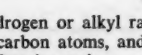
Int. Cl. C07c *141/02*

U.S. Cl. 260—458 4 Claims

Detergent active materials which are effective in the absence of phosphate builders comprise sulfur-linked linear alkyl vicinal disulfates of the formula:



in which Y is



R and R_1 are hydrogen or alkyl radicals having a total of from 9 to 23 carbon atoms, and X is hydrogen or a water-soluble salt-forming cation.

3,651,120

POLYFLUOROISOALKOXYALKYL SULFURIC ACIDS AND SALTS THEREOF

Louis Gene Anello, Basking Ridge, and Richard Francis Sweeney, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,120

Int. Cl. C07c *141/02*

U.S. Cl. 260—458 13 Claims

Novel sulfuric acid compounds characterized by having a polyfluoroisoalkoxyalkyl tail wherein an ether oxygen links a fluorinated carbon atom attached to two fluorinated alkyl groups and at least one —CF_2— group, and their metal, ammonium and substituted ammonium salts. These acids and salts are useful as surface active agents.

3,651,121

OXYDEHYDROGENATION PROCESS FOR PREPARATION OF DIENES

Roy B. Duke, Littleton, and David P. McGrew, Golden, Colo., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 722,170, Apr. 18, 1968, and Ser. No. 851,737, Aug. 20, 1969. This application Aug. 10, 1970, Ser. No. 62,722

Int. Cl. C07c *1/00, 5/18*

U.S. Cl. 260—465 K 32 Claims

Alcohols, e.g. tert-amyl alcohol are dehydrated and oxydehydrogenated in a two-stage, halogenated-promoted process by preferably first passing alcohol-halogen-oxygen mixture over a substantially inert contact-surface, e.g., Alundum, and then passing the mixture over a metallic oxide catalyst, e.g. copper chromite, to produce dienes, e.g. isoprene. Isoprene and other dienes are useful in the manufacture of elastomers used in the manufacture of tires and other elastomeric products.

3,651,122

SULFAMYL BENZOIC ACID COMPOUNDS

Laszlo Beregi, Boulogne, Pierre Hugon, Rueil Malmaison, Jean-Claude Le Douarec, Suresnes, and Michel Laubie, Vaucresson, France, assignors to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

No Drawing. Filed June 12, 1968, Ser. No. 736,286

Claims priority, application Great Britain, June 12, 1967, 27,112/67

Int. Cl. C07c *143/52*

U.S. Cl. 260—470 5 Claims

β - (3 - sulfamyl - 4 - chlorobenzoyloxy) ethylamine and β - (3 - sulfamyl - 4,6 - dichlorobenzoyloxy) ethylamine substituted on the amine function by —Alk—Ar wherein —Alk is —CH_2— or

wherein R_1 and R_2 are hydrogen or methyl and R_3 is hydrogen or alkoxy of up to C_4 inclusive, and —Ar is phenyl, chlorophenyl, bromophenyl or trifluoromethyl phenyl.

These compounds possess anorexigenic and diuretic properties and antihypertensive and lipid metabolism regulating activities.

3,651,123

3-ALKOXY-4-ARYLOXY-CIS-CROTONIC ACID ESTERS

Clarence L. Moyle, Clare, and Diomed M. Chern, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 29, 1968, Ser. No. 725,142

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 A 20 Claims

Novel 3 - loweralkoxy - 4 - aryloxy-cis-crotonic acid loweralkyl esters, prepared by reacting an aryloxide salt with a 4-halo-3-loweralkoxy-cis-crotonic acid loweralkyl ester. They are useful as plant growth inhibitors.

3,651,124

SUBSTITUTED 2-BROMO-2-NITRO-ALKYL ESTERS OF SALICYLIC ACID

Richard Wessendorf, Essen-Heisingen, and Horst Bellinger, Dusseldorf, Germany, assignors to Henkel & Cie., GmbH, Dusseldorf-Holthausen, Germany

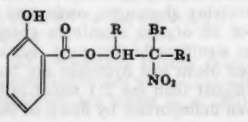
No Drawing. Filed Oct. 22, 1970, Ser. No. 83,235

Claims priority, application Germany, Nov. 6, 1969, P 19 55 854.4

Int. Cl. C07c *69/88*

U.S. Cl. 260—474 6 Claims

Novel salicylic acid esters of the formula



I

wherein R is selected from the group consisting of hydrogen, methyl and halogenated methyl, and R_1 is selected from the group consisting of hydrogen and methyl and ethyl which may be substituted with at least one hydroxy group which have antimicrobic activity and lower toxicity than the corresponding free alcohols.

3,651,125

CONTINUOUS METHOD FOR FORMATION OF A LIQUID MONOMER FOR A CONDENSATION POLYMER

Alan E. Lewis and Frederick W. Voight, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1968, Ser. No. 752,057

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 P 5 Claims

An improved method in which a liquid comprising a precursor for a condensation polymer monomer, such as the monomer, bis(β-hydroxyethyl)terephthalate, is reacted in a succession of zones by the addition in each zone of a heated vapor such as ethylene glycol vapor, which vapor condenses in part as the formation of monomer occurs, thereby providing heat to the liquid and combining with the liquid for reacting with the unreacted portion of the precursor, the remaining uncondensed portion of the precursor, the remaining uncondensed portion of the vapor in each zone sweeping the reaction byproducts from each zone without allowing the byproducts to enter any of the other zones and thus come into contact with the liquid in any such other zones.

3,651,126

PREPARATION OF o-METHYLBENZOIC ACID AND DERIVATIVES THEREOF

Anthony T. Jurewicz, Edison, and Le Roy S. Forney, Metuchen, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Jan. 16, 1969, Ser. No. 791,796

Int. Cl. C07c *69/78, 69/80*

U.S. Cl. 260—475 R 5 Claims

Phthalide and substituted (4, 5, 6, 7 positions) derivatives are converted to o-methylbenzoic acids by hydrogenolysis in alcohol, using a protic acid catalyst, over palladium metal catalyst. o-Methylterephthalic acid is prepared in this way from 5-carboxyphthalide, and is useful for making non-crystalline polyesters. o-Methylbenzoic acids have a variety of uses, such as the preparation of alkyl and polyester resins and in organic synthesis.

3,651,127

PROCESS FOR THE MANUFACTURE OF PHENYL ESTERS OR MIXTURES OF PHENYL ESTERS AND PHENOL FROM BENZENE

Lothar Hörnig, Frankfurt am Main, Hans-Jürgen Arpe, Kelkheim, Taunus, and Manfred Boldt, Fischbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 8, 1968, Ser. No. 711,475

Claims priority, application Germany, Mar. 17, 1967, F 51,849

Int. Cl. C07c *37/00, 51/32*

U.S. Cl. 260—479 R 10 Claims

Preparation of phenyl esters and, if desired, phenol by gaseous phase reaction of benzene, a carboxylic acid and molecular oxygen in the presence of a compound of a noble metal of Group VIII of the Mendeleeff Periodic Table as catalyst.

3,651,128

BACTERIOSTATIC CARBAMATES OF BISPHENOLS

Edward J. Nikawitz, Glen Rock, N.J., assignor to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed June 11, 1968, Ser. No. 736,008

Int. Cl. C07c *125/06*

U.S. Cl. 260—479 C 7 Claims

This disclosure relates to certain carbamates of halogenated bisphenols. These esters have been found to have useful and unexpected properties making them suitable for employment as anti-bacterial agents in a wide variety of compositions, including toilet soaps.

3,651,129

SIDE-CHAIN HALOGENATED ALKYLPHENYL CARBAMATES

Edward D. Weil, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application Aug. 29, 1963, Ser. No. 305,509, now Patent No. 3,420,868, dated Jan. 7, 1969. Divided and this application Nov. 7, 1968, Ser. No. 816,426

Int. Cl. C07c *125/06*

U.S. Cl. 260—479 2 Claims

Haloalkylphenylcarbamates, useful as insecticides, herbicides and bacteriostats, are prepared by way of the corresponding haloformates.

3,651,130

PROCESS FOR THE PRODUCTION OF ACETOACETIC ACID ESTERS

Othmar Marti and Willi Zimmerli, Visp, Valais, Switzerland, assignors to Lonza, Ltd., Basel, Switzerland

No Drawing. Filed July 25, 1968, Ser. No. 747,467

Int. Cl. C07c *69/72*

U.S. Cl. 260—483 6 Claims

An improved yield of an acetoacetic acid ester is obtained from a reaction between diketene and an alcohol in the presence of an acid catalyst, by converting the β-alkoxycrotonic acid ester, which is formed as secondary product in the reaction, into the corresponding acetoacetic acid ester by heating it with water.

3,651,131

PROCESS FOR CONVERTING TRIALKYLALUMINUM COMPOUNDS TO ALUMINUM ALKOXIDES

Russell G. Hay, Gibsonia, and John G. McNulty and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Nov. 17, 1969, Ser. No. 877,423

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 AD 8 Claims

A process for converting trialkylaluminum compounds to aluminum alkoxides which involves subjecting the trialkylaluminum compound to contact with molecular oxygen at moderate temperatures in the presence of a metallic compound of copper, iron, manganese, chromium, cesium, vanadium, titanium, nickel, magnesium, aluminum or zirconium.

3,651,132

CARNITINE SALTS OF N,N-DIMETHYLBIGUANIDE HYDROHALIDES AND MANUFACTURING THE SAME

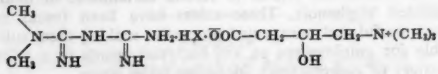
Tadahiro Dohi and Taneyoshi Yu, Naruto-shi, Takayuki Nakagawa, Tokushima-shi, and Kozi Hiraoka, Naruto-shi, Japan, assignors to Otsuka Pharmaceutical Company Limited, Tokyo-to, Japan

No Drawing. Filed May 27, 1969, Ser. No. 828,372

Int. Cl. C07c *101/00*

U.S. Cl. 260—501.13 2 Claims

The carnitine salts of N,N-dimethylbiguanide hydrohalides having the formula:



wherein X is a halogen atom. The present compounds are useful as anti-diabetic drugs.

3,651,133

o-ALKYLOXY-BENZOYL-HYDRAZONES OF PYRUVIC ACID EMPLOYABLE AS ANTIRHEUMATIC, ANTIPYRETIC AND ANALGESIC PRODUCTS

Mario Ghelardoni, Firenze, and Filippo Russo, Giarre, Catania, Italy, assignors to A. Menarini S.A.S., Firenze, Italy

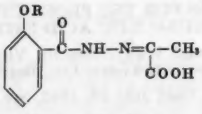
No Drawing. Filed Nov. 22, 1966, Ser. No. 596,092

Claims priority, application Italy, Nov. 23, 1965, 26,344/65

Int. Cl. C07c *109/14*

U.S. Cl. 260—519 1 Claim

A compound having therapeutic properties and the process for the preparation thereof. The therapeutic compound has the formula:



wherein R may be hydrogen or a lower alkyl group. The process for preparing the therapeutic compound of this invention comprises condensing the hydrazide of the appropriate o-substituted-benzoic acid with pyruvic acid in a solvent such as ethanol or diethyl ether.

3,651,134

5-ARYLALKOXY-1-HYDROXY-2-NAPHTHOIC ACIDS

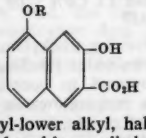
Bill Elpern, White Plains, Harris J. Shapiro, Bronx, and Harold Soloway, New Rochelle, N.Y., assignors to USV Pharmaceutical Corporation

No Drawing. Filed Feb. 10, 1970, Ser. No. 10,293

Int. Cl. C07c *65/14*

U.S. Cl. 260—520 4 Claims

Derivatives of 3,5-dihydroxy-2-naphthoic acid of the formula



wherein R is phenyl-lower alkyl, halophenyl-lower alkyl or trifluoromethyl-phenyl-lower alkyl are potent antimicrobial agents.

3,651,135

PREPARATION OF OXALIC ACID

Jacques Boichard, Bernard Pierre Brossar, Jacques Marius Duroux, and Raymond Marc Clement Janin, Lyon, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of application Ser. No. 539,775, Apr. 4, 1966. This application Dec. 1, 1969, Ser. No. 876,220

Claims priority, application France, Apr. 7, 1965, 12,311

Int. Cl. C07c *55/06*

U.S. Cl. 260—533 R 5 Claims

Oxalic acid is made by oxidizing propylene with at least 50% nitric acid at 40 to 80° C.

3,651,136

SYNTHESIS OF DL-THREONINE

George Foulds, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Nov. 6, 1969, Ser. No. 874,716

Int. Cl. C07c *101/30*

U.S. Cl. 260—534 M 6 Claims

DL-threonine may be prepared in good yield by a novel three-step process comprising the epoxidation of crotonic acid, followed by addition of chlorine and then ammonia to the resulting intermediates.

3,651,137

SELECTIVE CONVERSION OF $N^{alpha},N^{epsilon}$-DIACETYLLYSINE ESTERS TO $N^{alpha},N^{epsilon}$-DIACETYLLYSINE

Tucker T. Yee, Claymont, Del., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Dec. 23, 1969, Ser. No. 887,789

Int. Cl. C07c *103/50*

U.S. Cl. 260—534 L 7 Claims

The alkyl esters of $N^{alpha},N^{epsilon}$-diacetyllysine are converted to the $N^{alpha},N^{epsilon}$-diacetyllysine by first reacting the ester with ammonium hydroxide or an ammoniacal-alcohol solution to produce the $N^{alpha},N^{epsilon}$-diacetyllysine amide, a novel compound, and then by reacting the amide with glacial acetic acid saturated with gaseous hydrogen chloride to hydrolyze the amide to the $N^{alpha},N^{epsilon}$-diacetyllysine.

The diacetyllysine is a racemic mixture but is conveniently resolved by reaction with an optically active amine to form a mixture of the salts which can be separated by fractional crystallization from which the desired L-lysine is produced.

3,651,138

RESOLUTION OF DL-DIACETYLLYSINE

Tucker T. Yee, Claymont, Del., and Joseph A. Cahill, Philadelphia, and Joseph A. Meyers III, Springfield, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Dec. 23, 1969, Ser. No. 887,790

Int. Cl. C07c *101/24*

U.S. Cl. 260—534 L 3 Claims

Conversion of DL-diacetyllysine to diastereoisomeric salts by reaction with an optically active base such as D-(+)-alphamethylbenzylamine, separation of the salt of the desired L isomer from that of the D isomer by fractional crystallization, conversion of the salt of the L isomer

to L-diacetyllysine utilizing a cation exchange resin and finally hydrolysis of the L-diacetyllysine to L-lysine hydrochloride.

3,651,139
SPRAY-DRIED AGENT FOR FINISHING TEXTILES

Anton Feinauer, Wilhelm Ruettiger, Rolf Fikentscher, and Walter Pitteroff, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 13, 1967, Ser. No. 675,013
Claims priority, application Germany, Oct. 13, 1966, P 15 94 916.3
Int. Cl. C07c *127/14*; D06m *13/34*
U.S. Cl. 260—553 R **8 Claims**

A spray-dried agent for textile finishing which contains as active components at least one methylol compound of urea and, as a stabiliser to increase stability in storage, a small amount of a five- to seven-membered heterocyclic compound having one of the groupings

—NH—CO—NH—, —NH—CO—CH_2—

or

—NH—CO—O—

in the ring or a methylol derivative of such a heterocyclic compound.

3,651,140
AMINO AND AMIDO COMPOUNDS DERIVED FROM N - 3 - OXOHYDROCARBON-SUBSTITUTED ACRYLAMIDES

Lester E. Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation-in-part of application Ser. No. 657,787, Aug. 2, 1967, which is a continuation-in-part of application Ser. No. 586,391, Oct. 13, 1966. This application Dec. 4, 1969, Ser. No. 882,304
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 N **12 Claims**

N-3-oxohydrocarbon-substituted acrylamides, preferably diacetone acrylamide, react with polyamines and polyamides through the carbonyl group or the olefinic bond. The products are excellent curing agents for epoxy resins. They have low toxicity and skin and eye irritation, and resins cured therewith are stable to light and ultraviolet radiation.

3,651,141
2,6-DI(LOWER ALKANOYLAMINO)-3,4-DICHLOROPHENOLS

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Aug. 8, 1969, Ser. No. 848,697
Int. Cl. C07c *103/38*
U.S. Cl. 260—562 A **4 Claims**

2,6 - di(loweralkanoylamino) - 3,4 - dichlorophenols, e.g., 2,6-diacetamino-3,4-dichlorophenol. The compounds are useful as herbicides, bacteriostats, mold inhibitors and preservatives.

3,651,142
3-AMINO-2-(3,4-DIHALOPHENYL) BICYCLO[2.2.2]OCTAN-2-OL

Jules Freedman, Milwaukee, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Feb. 6, 1969, Ser. No. 797,233
Int. Cl. C07c *91/00*
U.S. Cl. 260—570.5 CA **7 Claims**

The compounds are 3-amino-2-(3,4-disubstituted)bicyclo[2.2.2]octan-2-ols which are useful in the treatment of depression. Representative compounds disclosed in the application are N-methyl-2-(3,4-dichlorophenyl)-3-aminobicyclo[2.2.2]octan - 2-ol hydrochloride, N-isopropyl-2-(3,4-dichlorophenyl)-3-aminobicyclo[2.2.2]octan - 2 - ol, and N,N-dimethyl - 2 - (3,4-dichlorophenyl)-3-aminobicyclo[2.2.2]octan-2-ol hydrochloride.

3,651,143
AMINO AND SUBSTITUTED AMINO CONTAINING BENZOCYCLOHEPTENONES

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Feb. 4, 1969, Ser. No. 796,567
Int. Cl. C07c *87/64*
U.S. Cl. 260—575 **4 Claims**

The compounds are 6-amino- and substituted amino-5H-benzocycloheptene-5-ones, which may be substituted or unsubstituted at the aromatic moiety, e.g., 6-amino-5H-benzocycloheptene-5-one, and are useful as hypnotic-sedative agents.

3,651,144
PRODUCTION OF ALKANOLAMINES

John B. Tindall, 448 Osborne St., Terre Haute, Ind. 47802

No Drawing. Filed June 6, 1969, Ser. No. 831,246
Int. Cl. C07c *85/10, 89/00, 89/04*
U.S. Cl. 260—584 R **1 Claim**

The alkanolamines 2-amino-1-butanol and 2-amino-2-ethyl-1,3-propanediol are produced simultaneously in good yield and quality in a process wherein 1-nitropropane is reacted with formaldehyde in a mole ratio of about 0.7 to about 0.9, reducing the nitroalkanols so obtained and separating the alkanolamines.

3,651,145
NOVEL DIKETO COLORING AGENTS

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application June 23, 1967, Ser. No. 648,196. Divided and this application Apr. 24, 1969, Ser. No. 819,520
Int. Cl. C07c *49/54*
U.S. Cl. 260—586 R **1 Claim**

Novel C_{40} and C_{50} diketo coloring and pigmenting agents for foodstuffs and the like and a process for their production from hydroxenin including intermediates therein.

3,651,146
PROCESS FOR THE PREPARATION OF TRIARYLBORANES

Don Morris von Schriltz, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 25, 1970, Ser. No. 14,192
Int. Cl. C07f *5/02*
U.S. Cl. 260—606.5 B **4 Claims**

An improved process for the preparation of triarylboranes such as triphenylborane which comprises reacting an aryl Grignard reagent with a trialkylborate, isolating the product by hydrolysis, extracting the resultant material with an organic solvent, washing, drying and concentrating the extractant to recover the crude product, and thereafter treating the crude product with an aliphatic hydrocarbon solvent which dissolves undesired by-products and leaves substantially pure triarylborane.

3,651,147
1,6-DIPHOSPHATRIPTYCENE

Kurt Weinberg, Upper Saddle River, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 621,763, Mar. 9, 1967, now Patent No. 3,557,207. This application Oct. 7, 1970, Ser. No. 78,962
Int. Cl. C07f *9/50*
U.S. Cl. 260—606.5 P **1 Claim**

This invention relates to the production of 1,6-diphosphatriptycene which compound is useful as a plasticizer,

flame retardant intermediate, a ligand in homogeneous catalysis and a reaction intermediate in the production of insecticide fuel and oil additives.

3,651,148
2-(6-METHOXY-2-NAPHTHYL)-1-PROPYL BORANES
Peter H. Nelson, Los Altos, Calif., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,475
Int. Cl. C07f *5/02;* **C07c** *43/20*
U.S. Cl. 260—606.5 B **2 Claims**

This invention relates to 2-(6-methoxy-2-naphthyl)-1-propyl boranes useful in the preparation of 2-(6-methoxy-2-naphthyl) propionic acid and 2-(6-methoxy-2-naphthyl)-1-propanol.

These products have anti-inflammatory, analgesic and anti-pyretic activities.

3,651,149
β-(6-METHOXY-2-NAPHTHYL)-9-BORABICYCLO-(3,3,1)-NONANE
Ian T. Harrison, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,458
Int. Cl. C07c *5/02;* **C07f** *43/20*
U.S. Cl. 260—606.5 B **1 Claim**

This invention relates to β-(6-methoxy-2-naphthyl)-9-borabicyclo(3,3,1)-nonane which is useful in the preparation of 2-(6-methoxy-2-naphthyl)propionic acid. The said propionic acid has anti-inflammatory, analgesic and anti-pyretic activities.

3,651,150
PREPARATION OF DI-ALKYLAROMATIC DISULFIDES
George H. Garrison, Andrew G. Horodysky, and Howard E. Philips, Beaumont, Tex., assignors to Mobil Oil Corporation
No Drawing. Filed Feb. 26, 1969, Ser. No. 802,663
Int. Cl. C07c *149/30*
U.S. Cl. 260—608 **20 Claims**

Reacting free sulfur with an aqueous alkali metal hydrosulfide (NaHS) solution, optionally having a minor monosulfide (Na_2S) content, to convert some of the hydrosulfide and most of any monosulfide present to the alkali metal disulfide (Na_2S_2); thereafter adding benzyl chloride or a similar haloalkylaromatic compound for accelerated and substantially complete conversion by the initial reaction products in the presence of methanol to form benzyl mercaptan and dibenzyl disulfide; adding a strong base (NaOH) after complete conversion of the benzyl chloride to raise the pH of the reaction mixture to about 10–11 to supplement the effect of the methanol in accelerating the reaction between the mercaptan and the sulfur in completing the formation of dibenzyl disulfide.

3,651,151
PREPARATION OF POLYPHENYL ETHER FROM DIHYDRIC PHENOLS
Robert F. Bridger, Hopewell, Robert E. Kinney, Lawrenceville, and Albert L. Williams, Princeton, N.J., assignors to Mobil Oil Corporation
No Drawing. Continuation-in-part of application Ser. No. 490,072, Sept. 24, 1965, which is a continuation-in-part of application Ser. No. 416,127, Dec. 4, 1964. This application May 12, 1969, Ser. No. 823,943
Int. Cl. C07c *41/04*
U.S. Cl. 260—613 R **6 Claims**

Dihydric phenols can be used directly in the Ullmann ether synthesis by using a copper salt catalyst and an amine solvent that dissolves the catalyst by forming coordinate covalent bonds with copper ions.

3,651,152
PROCESS FOR THE ALKOXYLATION OF COMPOUNDS CONTAINING ALCOHOLIC HYDROXYL GROUPS
Wilfried Umbach, Langenfeld, and Werner Stein, Erkrath-Unterbach, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany
No Drawing. Filed Sept. 19, 1969, Ser. No. 859,560
Claims priority, application Germany, Oct. 2, 1968, P 18 00 462.1
Int. Cl. C07c *41/02*
U.S. Cl. 260—611 B **7 Claims**

This invention relates to an improvement in the process of alkoxylation of compounds containing alcoholic hydroxyl groups by reacting compounds containing hydroxyl groups with alkylene oxides in the presence of alkoxylation catalysts. The said improvement involves the use of a stable carbonium ion as the said alkoxylation catalyst.

3,651,153
PRODUCTION OF ALCOHOLS
Gunther Strauss and Klaus Schneider, Marl, and Werner Jacquemin, Sythen, Germany, assignors to Chemische Werke Huls A.G., Marl, Germany
No Drawing. Filed Aug. 24, 1965, Ser. No. 482,238
Claims priority, application Germany, Aug. 24, 1964, P 12 94 960.9–42
Int. Cl. C07c *35/02, 35/08, 31/02*
U.S. Cl. 260—617 H **2 Claims**

Boric acid ester intermediates in the preparation of alcohols of non-aromatic hydrocarbons are produced by introducing boric acid in admixtures with water directly into the hydrocarbons undergoing oxidation.

3,651,154
PROCESS FOR PREPARING POLYHALO-NAPHTHOLS
Erwin Klingsberg, Geneva, Switzerland, assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Jan. 29, 1968, Ser. No. 701,115
Int. Cl. C07c *39/38*
U.S. Cl. 260—623 R **1 Claim**

A process for hydrolyzing polyhalonaphthalenes, such as octachloronaphthalene, by reacting the polyhalonaphthalene with an alkali metal hydroxide in a polar high boiling solvent miscible with water and inert to the hydroxide. Typical solvents are dimethyl sulfoxide, dimethyl sulfone, hexamethylphosphoric triamide, and N-methyl-2-pyrrolidone. A typical product is heptachloro-1-naphthol which is useful as a fungicide, algaecide and bactericide.

3,651,155
HIGH DENSITY FLUIDS
Richard Garth Pews and Ralph A. Davis, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 13, 1969, Ser. No. 807,123
Int. Cl. C07c *23/08, 23/10*
U.S. Cl. 260—648 F **7 Claims**

The present invention is a group of fluorobromocycloalkanes characterized by the formula:

wherein x is 5 or 6, z is 3 or 4 when x is 6 and 2 or 3 when x is 5 and the ratio of $(y+z)$ to x is 2:1.

Also provided is a process for preparing the compounds as defined above.

3,651,156
PROCESS FOR THE MANUFACTURE OF FLUORINATED ALIPHATIC HYDROCARBON COMPOUNDS

Otto Scherer, Bad Soden, Taunus, and Jurgen Korinth, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of application Ser. No. 681,077, Nov. 7, 1967. This application June 20, 1969, Ser. No. 835,238
Claims priority, application Germany, Nov. 12, 1966, F 50,664
Int. Cl. C07c *19/08*
U.S. Cl. 260—653 8 Claims

Manufacture of fluorinated aliphatic hydrocarbon compounds by disproportionation of fluorinated aliphatic substances under the influence of a catalyst obtained by fluorination at elevated temperatures of a hydrated oxide of trivalent chromium with hydrogen fluoride.

3,651,157
PROCESS FOR THE MANUFACTURE OF CARBONTETRACHLORIDE

Hans Krekeler, Wiesbaden, and Helmut Meidert, Wilhelm Riemenschneider, and Lothar Hornig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 8, 1968, Ser. No. 765,967
Int. Cl. C07c *17/00, 17/24*
U.S. Cl. 260—664 26 Claims

Process for the manufacture of carbon tetrachloride from benzene or mixtures of benzene and chlorinated aliphatic or aromatic compounds, or chlorinated aromatic compounds and chlorine in the absence of a catalyst in two reaction stages at temperatures within the range of from 6° to 400° C. in the first, and 400° to 800° C. in the second reaction stage and pressures within the range of from 20 to 200 atmospheres gage, the chlorine being used in an excess amount of up to 300% and the starting products being introduced together with the chlorine advantageously continuously in amounts of 0.2 to 4 moles per liter of reactor volume and per hour into a corrosion-resistant reactor.

3,651,158
MOLYBDENUM-ANTIMONY HYDROGENATION CATALYST

Donald C. Tabler, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 25, 1970, Ser. No. 49,992
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 8 Claims

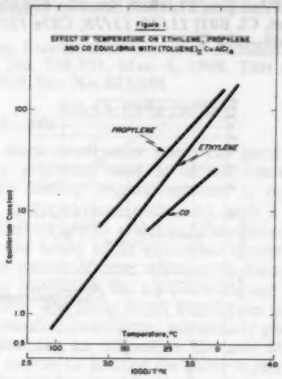
A method is disclosed for the hydrogenation of aromatics to naphthenes employing a supported molybdenum-antimony catalyst.

3,651,159
BIMETALLIC SALTS AND DERIVATIVES THEREOF, THEIR PREPARATION AND USE IN THE COMPLEXING OF LIGANDS

Robert B. Long, Atlantic Highlands, and Fred A. Caruso, Elizabeth, N.J., Richard J. de Feo, Baton Rouge, La., and David G. Walker, Baytown, Tex.; said Long, said Caruso, and said de Feo assignors to Esso Research and Engineering Company

Filed Sept. 3, 1968, Ser. No. 805,912
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. C07c *7/00, 11/00;* B01j *11/22*
U.S. Cl. 260—667 31 Claims

Bimetallic salts, having the generic formula $MM'X_n$ wherein M is a Group I–B metal, M′ is a Group III–A metal, X is a halide and *n* is equal to the sum of the valences of M and M′, are prepared by reacting the halogen salts of the individual metals, M and M′, in a suitable solvent. The bimetallic salt formed thereby is a discrete monomeric species and can be utilized in the separation and recovery of various ligands, by preferential complexation. Complexation can be conducted with the bimetallic



salt in the solid state, in solution, or as a slurry, and with the complexible ligand in the gases or liquid state. The ligand is recovered by decomplexation of the bimetallic salt-ligand complex or by displacement of the complexed ligand with another ligand.

3,651,160
PRODUCTION OF STYRENE

Guenter Reuss, Ludwigshafen, and Heinz Engelbach and Juergen Haug, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 11, 1969, Ser. No. 857,209
Claims priority, application Germany, Sept. 17, 1968, P 17 93 433.7
Int. Cl. C07c *15/10*
U.S. Cl. 260—669 5 Claims

A process for the production of styrene by catalytic dehydrogenation of ethylbenzene with oxygen or a gas containing molecular oxygen in the presence of steam in a fluidized bed at a temperature of from 350° to 600° C. using a solid catalyst and regenerating the catalyst by burning off the carbonaceous deposits, which comprises carrying out the regeneration of the catalyst, with incomplete burning off of the carbonaceous deposits with oxygen or a gas containing molecular oxygen, only to such an extent that on an average the catalyst contains during the reaction from 1 to 30% by weight of these carbonaceous deposits with reference to the catalyst. Styrene is a valuable monomer for the production of plastics.

3,651,161
PROCESS FOR THE ALKYLATION OF COMPOUNDS HAVING AN ACTIVE HYDROGEN

Toshihiko Waragai, Sagamihara-shi, Hideo Kawaguchi, Chigasaki-shi, and Takeo Saegusa, Kyoto-shi, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

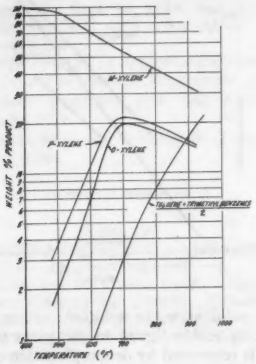
Filed Sept. 2, 1969, Ser. No. 854,602
Claims priority, application Japan, Sept. 30, 1968, 43/70,588, 43/70,589
Int. Cl. C07c *3/12, 3/52*
U.S. Cl. 260—671 C 3 Claims

The alkylation of compounds having an active hydrogen, allylic or benzylic, in the presence of complex catalysts such as sodium/pyrene and potassium/biphenyl. These catalysts form a charge transfer complex to which the catalyst activity is believably ascribed.

3,651,162
ISOMERIZATION AND DISPROPORTIONATION OF ALKYL AROMATICS

Hans P. Pohlmann, Highland, Louis C. Gutberlet, Crown Point, and Robert J. Hengstebeck, Valparaiso, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Feb. 27, 1969, Ser. No. 803,028
Int. Cl. B01j 11/40, 11/78; C07c 15/00
U.S. Cl. 260—672 T 7 Claims



Alkyl aromatic hydrocarbons are isomerized and disproportionated by contacting them at elevated temperatures in the presence of hydrogen gas with a catalyst comprising a silica-alumina cracking base impregnated with a hydrogenation component, a second metal from Group V–A of the periodic table, and a halogen. The preferred hydrogenation component is nickel, the preferred Group V–A metal is arsenic, and the preferred halogen is fluorine.

3,651,163
DEALKYLATION OF ALKYL BENZENES AND NAPHTHALENES

Herschel D. Radford, Flossmoor, Ill., and Hans P. Pohlmann, Highland, and Louis C. Gutberlet, Crown Point, Ind., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,107
Int. Cl. C07c 3/58; C10g 13/08, 39/00
U.S. Cl. 260—672 R 12 Claims

Alkyl benzenes and/or alkyl naphthalenes are dealkylated by contacting a feed stock rich in these compounds at elevated temperatures and under hydrogen pressure with a catalyst comprising a silica-alumina cracking base impregnated with a hydrogenation component, a second metal from Group V–A of the Periodic Table, and a halogen. The preferred hydrogenation component is nickel, the preferred Group V–A metal is arsenic, and the preferred halogen is fluorine. In the recovered product, at least a portion of the compounds have a reduced number of alkyl groups.

3,651,164
DEHYDROCYCLIZATION OF HYDROCARBONS

Donald C. Tabler and Marvin M. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed July 24, 1970, Ser. No. 58,179
Int. Cl. C07c 5/26
U.S. Cl. 260—673.5 9 Claims

A method for dehydrocyclization of alkanes having from about 7 to about 20 carbon atoms by contact with hydrogen and with a catalyst of nickel, cobalt or iron in combination with arsenic or antimony.

3,651,165
METHOD FOR RECOVERY AND PURIFICATION OF ISOBUTYLENE

Tatsuo Horie, Tokyo, Japan, assignor to Nippon Oil Company, Limited, Tokyo, Japan

Filed Aug. 28, 1969, Ser. No. 853,648
Claims priority, application Japan, Sept. 7, 1968, 43/64,171, 43/64,172
Int. Cl. C07c 11/02
U.S. Cl. 260—677 A 10 Claims

A process for recovering highly purified isobutylene comprising contacting an isobutylene-containing hydrocarbon mixture with an aqueous solution which is acidified with hydrochloric acid and containing a chloride of a metal selected from the group consisting of zinc, tin, antimony and bismuth to allow the isobutylene to be absorbed in the form of tert-butyl alcohol in the aqueous solution; removing unreacted hydrocarbons from said solution; subjecting the solution to degassing treatment; dehydrating tert-butyl alcohol to isobutylene; and decomposing tert-butyl chloride which is produced as by-product on dehydration step, to isobutylene.

3,651,166
RECOVERY OF ACIDS AND ORGANIC BASES FROM THEIR MIXTURES

David W. Hall, Vancouver, British Columbia, Canada, assignor to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Apr. 29, 1968, Ser. No. 725,206
Int. Cl. C07c 1/20
U.S. Cl. 260—681 20 Claims

Recovering acids and organic bases from their salts by heating the salt to its dissociation temperature and removing therefrom the acid or base wherein the salt dissociates at a temperature lower than the decomposition temperatures of the acid and base; the acid and base have different volatilities and the salt has a sublimation temperature higher than the dissociation temperature thereof.

3,651,167
SELECTIVE HYDROGENATION OF C_4-ACETYLENIC HYDROCARBONS

Armand J. de Rosset, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 745,963, July 19, 1968. This application Aug. 3, 1970, Ser. No. 60,656
Int. Cl. C07c 7/00
U.S. Cl. 260—681.5 8 Claims

Selective hydrogenation of C_4-acetylenes, for example ethylacetylene and/or dimethylacetylene, in admixture with butadiene, is effected in a fixed-bed system using a Group VIII noble metal component catalyst. A preferred catalyst comprises palladium in an amount of about 0.01% to about 0.2% by weight. Operating conditions include a temperature of from 35° C. to about 70° C. and a pressure in the range of about 10 p.s.i.g. to about 40 p.s.i.g. Catalyst stability is improved since the Group VIII metal components is surface-impregnated onto the porous carrier material.

3,651,168
PRODUCTION OF HEPTENES

Armin Stoessel, Frankenthal, and Heinz Engelbach, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 7, 1969, Ser. No. 789,586
Claims priority, application Germany, Jan. 9, 1968, P 16 43 735.7
Int. Cl. C07c 3/16
U.S. Cl. 260—683.15 C 14 Claims

Production of heptenes by reaction of propene with at least one butene in the presence of steam and a calcined

phosphoric acid/silica gel catalyst, using a catalyst which contains from 10 to 50% by weight of phosphoric acid and treating this catalyst with water in the liquid phase before and/or during the reaction. The heptene products of the process are valuable starting materials for the production of plasticizers, synthetic resins and raw materials for surface coatings.

3,651,169

EPOXY RESIN, AMINE OR AMIDEALDEHYDE, AND ORGANIC ESTER OF PHOSPHORIC ACID OR ORGANIC SULFONIC ACID

Lem Davis, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,536

Int. Cl. C08g *45/10*

U.S. Cl. 260—834 7 Claims

A thermosettable resin composition containing (A) a hydroxyl-containing resin, (B) a urea-aldehyde resin or a melamine-aldehyde resin, and (C) as a catalyst or reaction promoter, an alkyl or aryl ester of phosphoric acid or an alkyl or aralkyl ester of an organic sulfonic acid.

3,651,170

ARTICLE ADAPTED TO BECOME A POSITIVE PLANOGRAPHIC PRINTING PLATE

Julius L. Silver, Manchester, Conn., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Application May 14, 1968, Ser. No. 728,921, now Patent No. 3,514,288, which is a continuation-in-part of application Ser. No. 685,211, Nov. 22, 1967, which in turn is a continuation of application Ser. No. 406,901, Oct. 27, 1964. Divided and this application Feb. 4, 1970, Ser. No. 8,708

Int. Cl. C08g *37/18;* G03f *7/04*

U.S. Cl. 260—838 10 Claims

Article of commerce adapted to becoming a positive printing plate by the addition thereto of a photosensitive agent, said article comprising an oleophilic composition of an association product of a phenolic resin and an ethylene oxide polymer and a chromium trioxide component; and process for making such article.

3,651,171

THERMOPLASTIC MOLDING COMPOSITION CONTAINING MALEIC IMIDE COPOLYMERS AND RUBBERY POLYMERS

Wulf von Bonin, Leverkusen, Horst Niermann, Cologne, and Karl-Heinz Ott, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 19, 1970, Ser. No. 38,881

Claims priority, application Germany, May 21, 1969, P 19 25 996.2

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 G 2 Claims

It is known to convert copolymers of styrene and acrylonitrile which on their own are brittle into highly impact resistant thermoplastic moulding compositions by admixing rubbers.

A thermoplastic moulding composition comprising

(a) from 60 to 97% by weight of a hard maleic imide copolymers, and

(b) from 3 to 40% by weight of a rubber having a second order transition temperature below +10° C.

the rubber being present in the maleic imide copolymer in finely divided form.

3,651,172

METHOD FOR PREPARING LINEAR BLOCK COPOLYESTERS AND PRODUCT PRODUCED THEREBY

Kenneth T. Barkey and Lloyd I. Laird, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 710,751, Mar. 6, 1968. This application May 5, 1969, Ser. No. 822,048

Int. Cl. C08g *39/10*

U.S. Cl. 260—860 19 Claims

A linear block copolyester which has good fiber- and film-forming properties and is solvent-spliceable with common low boiling organic solvents is prepared by blending a poly(ethylene phthalate) with a copolyphthalate of ethylene glycol and 1,4-cyclohexanedimethanol and heating the blend under controlled temperature conditions for a period of time sufficient to form block copolyester but insufficient for equilibration and randomnization to occur. The linear block copolyester is especially useful for manufacture of films, particularly photographic film base, and can be utilized as the sole film-forming material or as one or both of the outer layers of a laminated film having a core of poly(ethylene terephthalate).

3,651,173

POLYESTER RESINS CROSSLINKED BY ALLYL DERIVATIVES OF ISOCYANURIC ACID

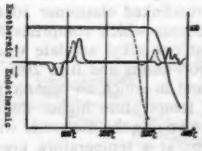
Kazuo Doi, Osaka, Takeru Murakami and Hideo Kawamura, Neyagawa, Katsutoshi Takaishi, Kyoto, and Yoshinobu Nakano, Neyagawa, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed June 1, 1970, Ser. No. 42,151

Claims priority, application Japan, May 31, 1969, 44/42,585, 44/42,586, 44/42,587, 44/42,592

Int. Cl. C08g *19/00, 21/00*

U.S. Cl. 260—868 5 Claims



A thermosetting solid resin composition containing one or both of prepolymers of unsaturated polyesters and prepolymers of polydiallylphthalates, an isocyanuric acid derivative as solid cross-linking agent, and an initiator. These compositions are suitable, inter alia, for producing decorative sheets and laminates, and do not become tacky at room temperature.

3,651,174

THERMALLY STABLE ALKALIN EARTH CARBONATE/POLYTETRAFLUOROETHYLENE MODIFIED POLYCARBONATE COMPOSITION

Charles A. Binlous, Mount Vernon, Ind., assignor to General Electric Company

No Drawing. Filed Apr. 15, 1970, Ser. No. 28,987

Int. Cl. C08f *45/54;* C08g *39/10*

U.S. Cl. 260—873 5 Claims

A polycarbonate composition consisting of an aromatic polycarbonate with 0.1 to about 2.0 weight percent of

an alkaline earth carbonate and another material which may be either an organosiloxane polymer or a polytetrafluoroethylene or a mixture of the two. The amounts of the organosiloxane polymer and/or polytetrafluoroethylene may be present in an amount of 0.1–2.0 weight percent based on the weight of the polycarbonate. More specifically, the alkaline earth carbonate which can be employed herein is barium carbonate.

3,651,175

POLYVINYL CHLORIDE RESIN COMPOSITION HAVING EXCELLENT IMPACT RESISTANCE AND WEATHERABILITY

Fumio Ide, Ohtake-shi, and Masanobu Miura, Ramaguchi-ken, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

No Drawing. Filed Nov. 9, 1970, Ser. No. 88,233
Claims priority, application Japan, Nov. 7, 1969, 44/89,180
Int. Cl. C08f *29/24, 41/12, 45/24*
U.S. Cl. 260—876 R **11 Claims**

A polyvinyl chloride resin composition having excellent impact resistance and weatherability can be obtained by blending 100 parts by weight of a vinyl chloride polymer with 5 to 80 parts by weight of a resin which comprises 20 to 80 parts by weight of a core-crust structural crosslinked polyalkyl acrylate elastomer (A) and 80 to 20 parts by weight of a polymer (B) obtained by polymerization of a vinyl monomer or a mixture thereof, at least a part of the monomer for a polymer (B) being graft-polymerized in the presence of elastomer (A), elastomer (A) being obtained by the steps of dissolving an organic peroxide having a decomposition temperature higher than 60° C. in a monomer comprising 80 to 100% by weight of at least one alkyl acrylate whose alkyl group has 1 to 10 carbon atoms and 0 to 20% by weight of a vinyl monomer, polymerizing said monomer in an aqueous solution containing a water soluble redox initiator and an emulsifier at a temperature lower than the decomposition temperature of said organic peroxide to obtain an elastomer latex, heating and stirring said elastomer latex at a temperature higher than the decomposition temperature of said organic perioxide to obtain a crosslinked elastomer latex, adding to a latex containing 100 parts by weight of said crosslinked elastomer 30 to 150 parts by weight of a monomer which comprises 80 to 100% by weight of at least one alkyl acrylate whose alkyl group has 1 to 10 carbon atoms and 0 to 20% by weight of a vinyl monomer and in which an organic peroxide having a decomposition temperature higher than 60° C. is dissolved, seed polymerizing the monomer with a water soluble redox initiator at a temperature lower than 60° C. in the presence of said latex containing crosslinked elastomer and heating the thus obtained latex to a temperature higher than 60° C.

3,651,176

METHOD FOR PREPARING ADHESION-IMPROVED ETHYLENE-PROPYLENE RUBBER COMPOSITION

Teruyoshi Usamoto, Higashiosaka, Masao Yokota, Ibaraki, and Tamotu Kondo, Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed June 11, 1969, Ser. No. 832,884
Claims priority, application Japan, June 11, 1968, 43/40,365
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 C **2 Claims**

A rubber of improved adhesion is prepared by a process comprising mixing an ethylene-propylene rubber with a halogenated butyl rubber or a halogenated ethylene-propylene rubber in an amount of 2–50 parts by weight per 100 parts by weight of the ethylene-propylene rubber.

3,651,177

THERMOPLASTIC POLYMER COMPOSITIONS AND PROCESS OF MAKING THE SAME

Kazuo Saito, 912 Irving Ave., Syracuse, N.Y. 13210; and Takeshi Tanaka and Ichiro Saito, both of 700 Torigai-mishi, Mishima-cho, Osaka, Japan

No Drawing. Continuation of applications Ser. No. 470,193, July 7, 1965, and Ser. No. 502,396, Oct. 22, 1965. This application June 27, 1969, Ser. No. 837,310
Claims priority, application Japan, Jan. 25, 1965, 40/3,924, 40/3,926
Int. Cl. C08f *19/08, 41/12*
U.S. Cl. 260—876 R **15 Claims**

Thermoplastic vinyl resins having high transparency and high impact resistance, consisting of a polybutadiene interpolymer or containing such interpolymer blended with a vinyl chloride polymer, said interpolymer being formed in two stages, in the first of which a butadiene polymer consisting of polybutadiene or containing at least 50% butadiene is polymerized with monomeric methyl methacrylate and in the second of which, monomeric aromatic vinyl compound is polymerized with the graft polymer formed in the first stage, the methyl methacrylate comprising from 10% to 80% of the total monomer addition, and the vinyl aromatic monomer comprising from 90% to 20% thereof; such polymerization being effected in an aqueous medium which contains, in relation to 100 parts of total resinous constituents, from 0.5 to 10.0 parts of formaldehyde sulfoxylic salt and effective amounts up to 3 parts of peroxides; at least 80% of said butadiene polymer at the start being in the form of particles below 0.2μ in diameter where the interpolymer is to be blended with vinyl chloride polymer, and below 0.1μ in diameter where the interpolymer is to be used alone; said butadiene polymeric material constituting out of each 100 parts of total resinous constituents, from 20 to 70 parts when the interpolymer is to be blended with vinyl chloride polymer, and from 20 to 60 parts when the interpolymer is to be used alone, the remainder of each 100 parts consisting of the sum of the monomeric additions.

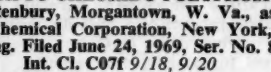
3,651,178

POLYMERCAPTO CHLORIDO POLYPHOSPHONITE

Kenneth Rattenbury, Morgantown, W. Va., assignor to Weston Chemical Corporation, New York, N.Y.

No Drawing. Filed June 24, 1969, Ser. No. 836,149
Int. Cl. C07f *9/18, 9/20*
U.S. Cl. 260—928 **9 Claims**

Compounds are prepared of the formula



where n is an integer of 1 to 10, X is chlorine or bromine, R_1 is alkyl, haloalkyl, aryl, haloaryl, alkenyl, aralkyl, haloalkenyl, or cycloalkyl, and R is a divalent aromatic, aliphatic or cycloaliphatic group.

3,651,179

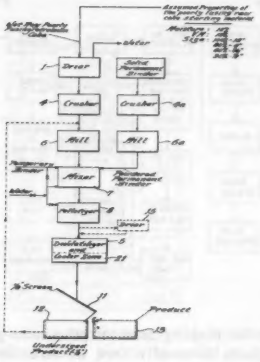
AGGLOMERATING OXIDIZED OR WEATHERED CARBONACEOUS MATERIAL USING POWDERED PITCH OR ASPHALT AS BINDER

Frederick L. Shea, Jr., 806 Wedgewood Drive, and Harry L. Hsu, 1608 Woodmont Drive, both of Johnson City, Tenn. 37601

Continuation-in-part of application Ser. No. 565,603, July 15, 1966. This application July 9, 1969, Ser. No. 842,822
Int. Cl. C09c *1/58;* **C10b** *57/02, 57/06*
U.S. Cl. 264—29 **12 Claims**

Conventionally granular carbon pellets are made from high volatile content carbonaceous material, such as raw petroleum coke having at least 9% volatile matter, by grinding, mixing with water and a temporary binder such as starch or sulphite liquors, pelletizing on a pelletizing

disk and finally heating to about 1650° F. in an inert atmosphere. It has been found that if the carbonaceous material has been oxidized or badly weathered that strong pellets will not be produced in the conventional manner in spite of the fact that the oxidized or weathered material



has a volatile matter content of at least about 9%. This problem is solved by adding more than one and up to twenty parts of a solid powdered (−20 mesh and fines) pitch or asphalt binder, having a softening point above about 150° F., to the mixture prior to pelletizing.

3,651,180

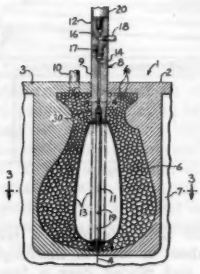
METHOD OF MOLDING EXPANDABLE POLYSTYRENE PARTICLES USING AN INFLATABLE CORE IN THE MOLD CAVITY

Robert C. Glueckert, Mount Prospect, Ill., assignor to Foam Forms, Inc.

Filed Aug. 8, 1968, Ser. No. 751,189

Int. Cl. B29d 27/00

U.S. Cl. 264—51 **7 Claims**



A foam molding method utilizing an inflatable core removably positioned in a mold cavity. Pre-expanded foamable polystyrene particles of plastic are introduced into the mold and around the inflated core and are heated, expanding the particles and forming a cellular article with a hollow corresponding to the shape of the inflated core. The mold parts are separated, the core is deflated, and the molded article is stripped from the core. The inflatable core contains a core pin which fixes the position of the core element within the mold cavity.

3,651,181

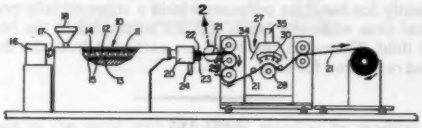
ODOR REDUCTION IN LOW DENSITY MEDIUM IMPACT POLYSTYRENE FOAM

Lawrence T. Ramalka, Media, Pa., assignor to Scott Paper Company, Delaware, Pa.

Original application Sept. 25, 1967, Ser. No. 670,366. Divided and this application July 22, 1969, Ser. No. 859,605

Int. Cl. B29d 27/00

U.S. Cl. 264—51 **3 Claims**



A method and apparatus are disclosed for reducing or eliminating the odor emitted from low density medium impact polystyrene resin foams, for example, polystyrene foams containing a butadiene component, to enable their use in plastic articles such as containers. The use of both an open flame and a corona discharge for deactivating odor-causing constitutents in such resin foams is disclosed. Chief utility of the invention lies in the treatment of such foams in the form of a sheet having a substantially continuous, impervious, nonporous, integral skin on each surface thereof, and an internal core which comprises the major portion of the thickness of the sheet, which core has undergone further expansion due to foaming after formation of the skins.

3,651,182

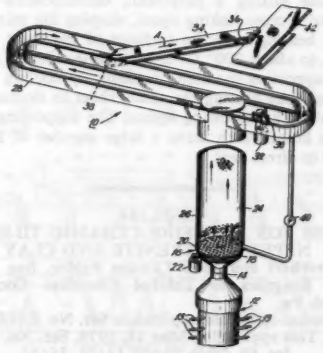
METHOD OF MAKING MULTICELLULAR THERMOSET FOAMED PLASTIC BEADS

Daniel Rosenthal, 525 Whitehall St., Lynbrook, N.Y. 11563

Filed Apr. 24, 1969, Ser. No. 818,866

Int. Cl. B29b 1/02; B29d 27/02

U.S. Cl. 264—51 **10 Claims**



Small, generally spherical cellulate, tough-skinned beads of thermoset plastic material. The beads are suitable for many industrial uses. The heads are made by dropletizing a thermomettable plastic material while the same is still in liquid form and while it contains a blowing agent. The conditions are such that the blowing agent is activated while the thermosettable material is in droplets. The droplets are suspended in a body of fluid so that

the influence of gravity is considerably lessened. Thereby the liquid droplets tend to assume a generally spherical shape and not to agglomerate. While still in this spherical configuration the blowing agent forms cells which are able to expand because the material is liquid or gelling. However, the viscosities of the liquid and gel are sufficient to prevent the walls separating the cells from becoming so thin that the ultimate solidified beads are highly frangible. The curing, i.e., setting, time of the material is sufficiently short under the prevailing conditions to permit the cellulated expanded beads to set, i.e., cure, sufficiently for handling purposes within a commercially practical time while the beads still are suspended in the body of fluid. Thereafter the beads are extracted from the fluid and recovered for sale.

3,651,183

SURFACE HEATING OF A FOAMABLE POLYOLEFIN PREFORM PRIOR TO FOAMING AND CROSSLINKING

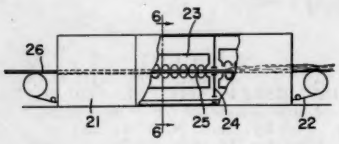
Kirokuro Hosoda, Yokohama, and Naonori Shiina, Tokyo, Japan, assignors to The Furukawa Electric Company Limited, Chiyoda-ku, Tokyo, Japan

Continuation-in-part of applications Ser. No. 442,523, Mar. 24, 1965, Ser. No. 610,880, Jan. 23, 1967, Ser. No. 645,444, June 12, 1967, and Ser. No. 792,180, Oct. 18, 1968. This application Nov. 25, 1968, Ser. No. 778,443

Claims priority, application Japan, Mar. 31, 1964, 39/17,919

Int. Cl. B29d *27/00*

U.S. Cl. 264—54 **16 Claims**



A method of continuously manufacturing foam sheets comprising mixing a polyolefin, decomposable blowing agent and a cross linking agent, shaping the mixture into a sheet, heating only the surfaces of the sheet to about 100° C. to about 300° C. to prevent sticking of the sheet to the supporting medium, immediately cooling said surfaces and then heating the entire sheet to decompose the cross-linking and blowing agents. The supporting medium contains holes which leave a large number of fine areas exposed to direct heat.

3,651,184

PROCESS FOR FAST-FIRE CERAMIC TILE USING NEPHELINE SYENITE AND CLAY

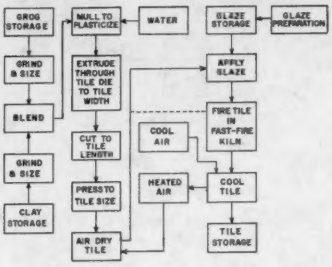
John Everhart and John Lawson Felder, San Antonio, Tex., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Continuation-in-part of application Ser. No. 5,618, Jan. 26, 1970. This application May 18, 1970, Ser. No. 38,370

Int. Cl. C04b *33/00, 33/24, 33/32*

U.S. Cl. 264—56 **4 Claims**

Composition and process for manufacturing fast-fire ceramic tile, particularly large-sized floor and wall tiles of ¼" to 1' x 12" x 12" dimensions or larger, comprise a system in which the function usually performed by the clay ingredient, as the plasticizer and binder in the fired ware in usual ceramic-forming compositions, is performed instead by a fusible material, nepheline syenite, which serves also as the grog ingredient in the pre-fired stages, and in which system the clay, reversely, performs the usual skeleton-forming function of the grog in the fired ware. The tile body making composition consists essentially by weight of 20 to 80% of nepheline syenite and from 80 to 20% of a clay whose incipient fusion point is substantially above that of the nepheline syenite and which contains less than 15%, and preferably less than 5%, by weight of free quartz. The composition is



essential for making semi-vitreous, non-glazed or glazed, tile products unusually free of structural defects, such as cracking, warpage and poor dimensional uniformity, by means of a novel fast-fire process in which the tiles are fired in the temperature range of about 1800 to 2200° F. from their greenware state to matured, fired products in from about one to three hours.

3,651,185

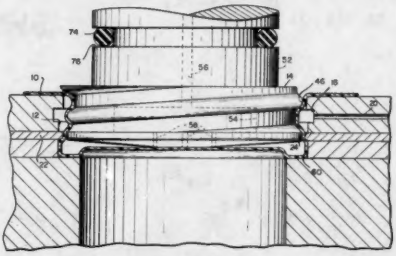
METHOD FOR THERMOFORMING A SCREW CAP CLOSURE

Gary G. Menkel, Holliswood, N.Y., assignor to Design Center, Inc., Long Island City, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,848

Int. Cl. B29c *17/04*

U.S. Cl. 264—89 **6 Claims**



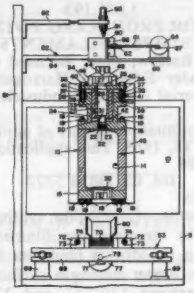
A method for thermoforming a screw cap closure wherein a flat sheet or web of thermoplastic material is initially heated and placed over a female mold cavity and a mating male mold is pressed against the heated plastic sheet to draw a portion of the sheet into the female mold cavity. Air is injected into the mold at two points; the first being through the top of the male mold thereby to expand the plastic sheet against the lower portion of the female mold and the second is through the upper portion of the female mold to force the sheet to conform tightly against thread forming contours which are provided on the male mold. The male mold is then withdrawn bringing the formed cap in the web with it and the mold is twisted out of the formed cap, leaving the formed cap in the web.

3,651,186

METHOD FOR FORMING BLOW MOLDED ARTICLES OF ORIENTED THERMOPLASTIC MATERIAL

John N. Hall, Brookside Park, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 29, 1968, Ser. No. 717,083
Int. Cl. B29c 17/07
U.S. Cl. 264—94 2 Claims



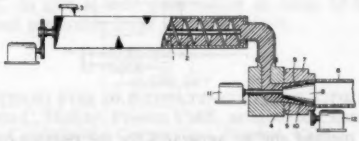
This invention relates to blow molding hollow articles such as bottles of oriented plastic material and particularly to forming a well-defined peripheral projection means, such as a cap-receiving screw thread on the periphery of the bottle at the neck, and comprises shifting longitudinally that portion of the screw thread of the bottle after the bottle has been blown and while it is still under blowing pressure.

3,651,187

EXTRUSION PROCESS

Lawrence C. Cessna, Jr., Grendon Farms, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 16, 1969, Ser. No. 866,913
Int. Cl. B29d 3/02
U.S. Cl. 264—108 3 Claims



A method is described for effecting circumferential orientation of reinforcing fibers in an extruded tubular plastic shape. The polymer, containing reinforcing fibers, is extruded through an annular tube forming die while being subjected to both longitudinal and circumferential velocity components. The longitudinal component has a gradient in the radial direction, while the circumferential component has gradients in the radial and longitudinal directions. A preferred means of accomplishing the process is by use of a conical rotating die.

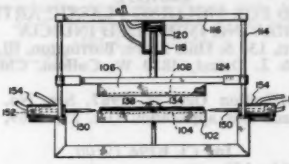
3,651,188

METHOD OF PRODUCING A HOLLOW HAMMER HANDLE WITH LONGITUDINALLY TENSIONED FIBERS

Wayne Wolf, Cedar Rapids, Iowa, assignor to Vaughan & Bushnell Mfg. Co., Hebron, Ill.

Original application Apr. 21, 1969, Ser. No. 817,805, now Patent No. 3,613,753, dated Oct. 19, 1971. Divided and this application Sept. 22, 1970, Ser. No. 74,377
Int. Cl. B29g 1/00
U.S. Cl. 264—136 7 Claims

A method of forming a hollow hammer handle having longitudinally tensioned fiber glass strands extending throughout its length, said method including placing a length of polymerizable plastic-saturated fiber glass roving in a mold, penetrating an end of the saturated roving



while in the mold with a pointed mandrel to produce a cavity and tension the fibers by back flow of the plastic, and finally polymerizing the plastic.

3,651,189

WATER TREATMENT PROCESS

Harry T. Anderson, Clarendon Hills, Ill., assignor to Swift & Company, Chicago, Ill.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,052
Int. Cl. C23f 13/00
U.S. Cl. 204—147 7 Claims

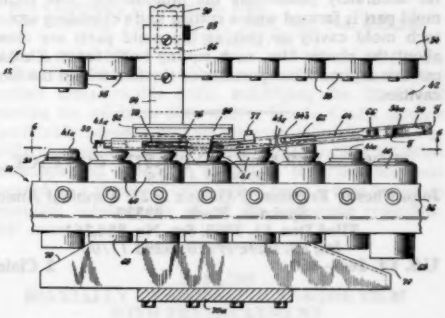
An electrical current system in conjunction with low level chelation treatment has been found to alleviate problems of corrosion and precipitation of unstable dissolved solids at both low and elevated temperatures.

3,651,190

MANUFACTURE OF COMPOSITE ARTICLES OF MOLDABLE AND NONMOLDABLE MATERIALS

Edward J. Fitz, Fairfield, Conn., assignor to Eagle-Picher Industries, Inc.

Continuation of application Ser. No. 674,363, July 3, 1967, which is a division of application Ser. No. 422,354, Dec. 30, 1964, now Patent No. 3,335,458. This application Mar. 10, 1970, Ser. No. 17,047
Int. Cl. B29d 3/00
U.S. Cl. 264—153 4 Claims



Forming a plurality of composite articles by consecutively feeding nonmoldable members into cooperating blanking dies. A projecting portion of one of the dies contacts the leading edge of an inclined nonmoldable member stopped in a chute and moves the nonmoldable member through the end of the chute while seating the member in the projecting die portion. The projecting die portion and member are then retracted and the dies cooperative to

blank molding material from a strip and to mold the material against the nonmoldable member. The dies then open and the projecting portion ejects the composite article.

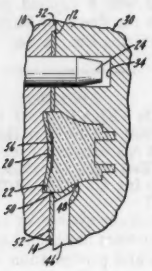
3,651,191
METHOD FOR MOLDING PLASTIC ARTICLES HAVING IMBEDDED INDICIA

Jack E. Glatt, 134 S. Hills Drive, Barrington, Ill. 60010, and Jacob J. Detzel, 4830 W. Cullom, Chicago, Ill. 60641

Original application Oct. 25, 1967, Ser. No. 677,965. Divided and this application Oct. 29, 1969, Ser. No. 871,348

Int. Cl. B29d *19/00*

U.S. Cl. 264—153 **1 Claim**



A method for making plastic articles having a bonded plastic film overlay under which indicia may be protectively imbedded which includes the steps of: (1) positioning a plastic film between two mold parts; (2) forming a line of reduced strength around those portions of the plastic film within the mold cavities; and (3) injecting molten plastic into each mold cavity and fusing the film thereto. Indicia may be applied to the plastic film.

A mold for making plastic articles including a first part and a second part adapted to close in registry to form at least one mold cavity; the first mold part is formed with a recess adapted to receive the plastic film and locator pins for accurately positioning the film therein. The second mold part is formed with a cutting knife extending around each mold cavity so that as the mold parts are closed about the plastic film, each cutting knife forms a closed cut line around those portions of the film within the mold cavities.

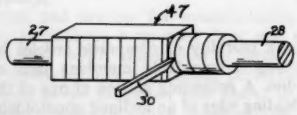
3,651,192
PROCESS FOR MAKING PLASTIC CONTACT LENS BLANKS

John Chester Erickson, P.O. Box 2621, Terminal Annex, Spokane, Wash. 99220

Filed Dec. 11, 1969, Ser. No. 884,263

Int. Cl. B29c *17/10*; B29d *11/00*

U.S. Cl. 264—160 **2 Claims**



Plastic contact lens blanks are formed by pouring the plastic between two parallel spaced glass sheets to form a resultant plastic sheet having smooth clear surfaces and a uniform density and refractive index. The plastic sheet is then cut into squares that are slightly larger than the diameter of the desired circular blanks. The square pieces are positioned between spindles and rotated while the periphery is being machined by a cutting tool down to the desired diameter.

3,651,193
PROCESS FOR PRODUCING POTENTIALLY CRIMPED FILAMENTS

George Edward Barlow, Peter Bernard Checkland, and Robert Alexander Edington, Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 507,648, Nov. 15, 1965. This application Apr. 7, 1969, Ser. No. 814,186

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **6 Claims**

Crimped filaments of meltspun synthetic linear polymer are made by drawing the filaments, then asymmetrically heating the drawn filaments by passing them in contact with a heater having a surface maintained at a temperature between 170° C. and 270° C. that the angle of deflection is less than 45° and then relaxing the filaments.

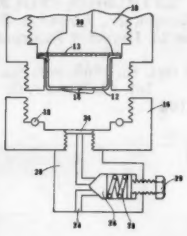
3,651,194
PROCESS AND APPARATUS FOR START-UP OF FIBER-SPINNING SOLUTIONS

Thomas C. Bohrer, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 4, 1968, Ser. No. 781,030

Int. Cl. D01d *1/10, 7/00*

U.S. Cl. 264—169 **6 Claims**



A method and an apparatus for the start-up of a fiber dry spinning operation wherein the spinning solution is maintained at a temperature above the boiling point of the solvent in order to maintain a spinnable solution. The apparatus seals the spinneret jets to permit a build-up of pressure and temperature in the spinning system to the required spinning conditions while permitting solvent bleedoff to produce a flow of spinning solution into the spinneret. Subsequently, the sealing means is disengaged to open the spinneret orifice for spinning.

3,651,195
PROCESS FOR PRODUCING COMPOSITE FILAMENTS

Ole-Bendt Rasmussen, 7 Topstykket, 3460 Birkerod, Denmark

Filed May 29, 1968, Ser. No. 733,090

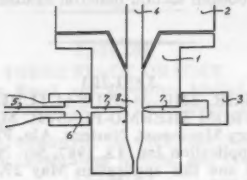
Claims priority, application Great Britain, May 30, 1967, 24,836/67

Int. Cl. B29f *3/10*

U.S. Cl. 264—171 **9 Claims**

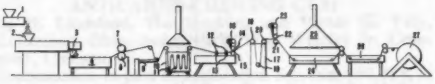
A filament material comprises a core consisting of a substantially homogeneous polymer material (A) and a coat consisting of two mutually incompatible polymer materials (B) and (C) where (B) is compatible with

(A) and form a substantially helical fibrous structure on the surface of (A) and (C) is easily removable. To make the filament material, a dispersion of (B) and (C) is



applied to the surface of (A) while this is being extruded whereafter the extruded strand is subjected to stretching and twisting.

3,651,196
PREPARATION OF ORIENTED POLYMERIC STRAPPING
Howard W. Starkweather, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed July 29, 1969, Ser. No. 845,692
Int. Cl. B29c *17/00;* **C08f** *29/12;* **D01d** *5/08*
U.S. Cl. 264—178 **9 Claims**

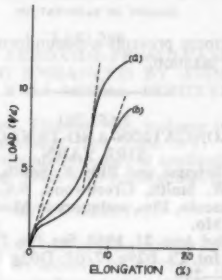


Manufacture of strapping from resin at least 75% of which is polyethylene having a density of at least 0.95 g./cc. and preferably from 0.955 to 0.967 g./cc. and a melt index of from 0.2 to 1.0 and preferably from 0.4 to 0.9 by extruding a billet, roll orienting the billet, followed by stretching at ambient temperature, followed by stretching in a liquid bath maintained at from 93° C. to the melting point of the polyethylene and preferably from 110 to 130° C. to give a total deformation of from 10 to 18 times and preferably from 11 to 13.5 times.

3,651,197
METHOD FOR FABRICATING ELBOW GORES
Edwin C. McKay, Fresno, Calif., assignor to Climate Conditioning Corporation, Stanton, Calif.
Filed Apr. 20, 1970, Ser. No. 29,950
Int. Cl. B29c *25/00*
U.S. Cl. 264—230 **7 Claims**

A method for making elbow segments or gores of thermoplastic pipe such as polyvinyl chloride employs heat shrinking of extruded pipe onto a mold. A short length of pipe is heated, turned inside out, placed on the mold and shrunk in place with the aid of a cable tightened around the midsection of the gore on the inside of the elbow bend. Because the pipe section is turned inside out before shrinking, the elbow gore has cylindrical ends free of flaring.

3,651,198
DRAWING AND HEAT TREATMENTS OF POLYESTER FILAMENTS
Yukio Mitsuishi, Masanori Matsuura, and Toshimasa Kuroda, Ibaragi-shi, Osaka-fu, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Feb. 11, 1969, Ser. No. 798,426
Claims priority, application Japan, Feb. 15, 1968, 43/9,510; Apr. 20, 1968, 43/26,467
Int. Cl. D02j *1/22*
U.S. Cl. 264—235 **10 Claims**



Process for drawing and heat-treating polyester filaments comprising subjecting undrawn polyester filaments to a first drawing at a relatively low temperature (T_1), subjecting the filaments to a second drawing at a temperature (T_2) lower than T_1 at draw ratio at least 80% of the maximum draw ratio at this stage, subjecting the filaments to a first heat treatment under tension at a temperature (T_3) higher than T_2, and thereafter subjecting the filaments to single or multi-staged second heat treatment performed at temperatures higher than temperature T_3 under tension, the temperature of at least one stage of the second heat-treatment being 110° C.

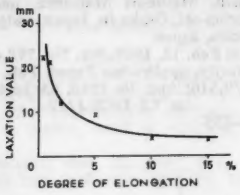
3,651,199
PROCESS FOR PRODUCING PHENOL-ALDEHYDE RESIN FIBERS
Roe C. Blume, Wilmington, Del., and Ludwig E. Seufert, Boothwyn, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Apr. 3, 1969, Ser. No. 813,289
Int. Cl. B29c *25/00*
U.S. Cl. 264—236 **10 Claims**

Phenol-aldehyde resin fibers are produced by extruding molten cross-linkable resin, solidifying the fiber, and treating the solidified fiber with a Friedel-Crafts catalyst (preferably boron trifluoride etherate or methanesulfonic acid) to cross-link the surface of the fiber. The resultant self-supporting fiber with a core of cross-linkable resin encased by a sheath of cross-linked resin is then heated to cross-link substantially all of the remaining cross-linkable resin.

3,651,200
BIAXIALLY DRAWING POLYAMIDE FILM WITH PRETREATMENT
Mutsuo Kuga, Kyoto-shi, and Takeshi Mashimo, Junkichi Watanabe, Teruo Arai, and Yoshihiko Yano, Uji-shi, Japan, assignors to Unitika Kabushiki Kaisha, Hyogo-ken, Japan
Filed Aug. 28, 1969, Ser. No. 853,687
Claims priority, application Japan, Aug. 31, 1968, 43/62,622
Int. Cl. B29c *17/02*
U.S. Cl. 264—289 **13 Claims**

Prior to biaxially drawing a polyamide film, the film is elongated in the longitudinal direction to an extent of 1

to 15% in addition to the natural elongation due to water adsorption while adsorbing 2 to 10% by weight water.

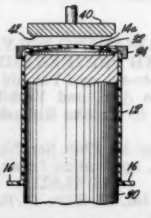


This pretreatment prevents a nonuniformity defect in the film termed "laxation."

3,651,201
HIGH-ELONGATION-AND-TENACITY NYLON TIRE YARN
Edmond P. Brignac and Billy E. Smith, Pensacola, Fla., Wallace W. Smith, Greenwood, S.C., and Emilio J. Solo, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.
Filed Aug. 21, 1968, Ser. No. 754,254
Int. Cl. B29c *17/02*; D02g *3/48*
U.S. Cl. 264—290 **1 Claim**

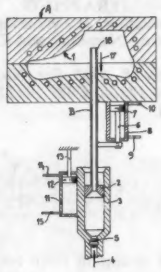
Elongation of high tenacity yarn is increased by heating the yarn to a temperature between 180° and 235° C., while under a tension between 0.05 and 0.35 gram per denier, for a period of 0.003 to 0.15 second.

3,651,202
PRODUCTION OF PLASTIC CONTAINERS
Erwin M. Raabe, Westfield, N.J., assignor to Rheem Manufacturing Company, New York, N.Y.
Filed Mar. 31, 1970, Ser. No. 24,238
Int. Cl. B29d *23/13*
U.S. Cl. 264—292 **1 Claim**



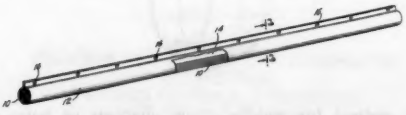
Hollow cup-shaped thermoplastic containers are formed by drawing material from a sheet blank of thermoplastic material into a die cavity with a plunger to form the wall section of the container. The partly-formed container is then placed in an inverted position on a mandrel, and the bottom section of the container is formed by working the bottom section material against the mandrel.

3,651,203
PROCESS FOR THE MANUFACTURE OF SOLID PARTS FROM THERMO-PLASTIC MATERIAL
Henry Massonnet, Nurieux, Ain, France
Original application Jan. 13, 1967, Ser. No. 609,045. Divided and this application May 29, 1969, Ser. No. 851,513
Claims priority, application France, Jan. 15, 1966, 46,823
Int. Cl. B29f *1/06*
U.S. Cl. 264—328 **4 Claims**



Large solid objects are moulded from plastic material by injecting the molten material into a mould via a conduit which is progressively withdrawn from the mould during the injection process. The disclosure may be applied directly to a moulding process, or it may be used to repair moulded articles which are defective owing to internal cavities.

3,651,204
HYDROTHERMAL TREATMENT OF COLLAGEN SUTURES
Joseph Nichols, Princeton, N.J., and Frederick H. Sexsmith, Erie, Pa., assignors to Ethicon, Inc., Somerville, N.J.
Filed Oct. 2, 1969, Ser. No. 863,133
Int. Cl. B29c *25/00*
U.S. Cl. 264—342 **22 Claims**



The pliability and "hand" of an extruded tanned collagen suture is improved by immersing the strand in an aqueous medium for a time sufficient to shrink the suture about 2%–6% of its initial length. After the hydrothermal treatment, the collagen strand is dried and heated at a temperature of about 110° C. to 149° C. for about an hour.

ERRATUM

For Class 424—330 see:
Patent No. 3,651,088

3,651,205
THREE STAGE DRAGÉE

Alfred Hunger, Basel, and Guenther Muller, Arlesheim, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,322
Claims priority, application Switzerland, Nov. 2, 1967, 15,344/67
Int. Cl. A61k *19/00, 27/00*
U.S. Cl. 424—21 **4 Claims**

A pharmaceutical preparation, in the form of a three-stage dragée, suitable for oral administration containing 4,7-phenanthroline-5,6-quinone together with pancreatin, bromelin, dehydrocholic acid, 5,7-dichloro-8-hydroxyquinoline and a suitable carrier.

The new preparations are particularly suitable for the treatment of digestive disturbance, and troubles, diarrhoses, dyspepsias, obstipations or gastrocardial symptom complex.

3,651,206
ANTICARIES CHEWING GUM

John H. Litchfield, Worthington, and Victor G. Vely, Columbus, Ohio, assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 790,314, Jan. 10, 1969. This application Sept. 18, 1969, Ser. No. 858,996
Int. Cl. A61k *7/16, 9/00*
U.S. Cl. 424—48 **19 Claims**

Unique chewing gum compositions possessing anticaries activity characteristics comprising a chewing gum base and one or more of the compounds pyruvaldehyde, glycaraldehyde, glycolaldehyde and α-hydroxypropionaldehyde. The chewing gum compositions can and preferably do contain abhesive and flavoring agents.

3,651,207
PREPARATION FOR USE IN MOUTHWASH HAVING EFFERVESCENCE

Frederick L. Lauster, Massillon, and Sheldon W. Fantle, Canton, Ohio, assignors to Lafant Research Company, Canton, Ohio

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,137
Int. Cl. A61k *7/16*
U.S. Cl. 424—50 **2 Claims**

A preparation or formulation is provided, in loose powder form, or in the form of compressed tablets or wafers, which, when added to water, forms an effervescent mouthwash or mouthwash solution. The preparation contains anti-oxidants, preservatives, antacid or buffering agents, anti-irritants, bacteriostatic and therapeutic agents having healing properties, and flavoring agents, which conjointly act to form a mouthwash of pleasing flavor or taste, and after taste.

3,651,208
DENTIFRICE FOR PERIODONTIA PURPOSES

Frederick L. Lauster, Massillon, Ohio, assignor to Lafant Research Company, Canton, Ohio

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,136
Int. Cl. A61k *7/16*
U.S. Cl. 424—54 **2 Claims**

A dentifrice is provided which is particularly effective in creating an improved climate within the mouth for the treatment of inflamed periodontium or periodontal tissues, and is characterized by the inclusion therein of ingredients having bacteriostatic and fungicidal properties, including those which attack gram-positive and gram-negative bacteria, both the aerobic and anaerobic spirochetes, large virus and certain protozoa, in addition to exercising an antifungal activity in oral infections caused by *Candida albicans*. It also acts as a protective for irritated and inflamed mucous membranes and as an oral lavage, and assists in the removal of tenacious mucous.

3,651,209
HYDROGEN PEROXIDE-PERSULFATE HAIR BLEACHING ENHANCED BY AMMONIUM OR AN ALKALI METAL PEROXYDIPHOSPHATE

Bernard Cohen, Trenton, N.J., assignor to FMC Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 733,268, May 31, 1968. This application Nov. 12, 1968, Ser. No. 775,202
Int. Cl. A61k *7/12*
U.S. Cl. 424—62 **4 Claims**

Process of bleaching hair at substantially room temperature with an aqueous solution of hydrogen peroxide (or a compound yielding hydrogen peroxide in aqueous solution) and either ammonium persulfate or an alkali metal persulfate, in which the bleaching effectiveness of the above mixture is enhanced by adding either ammonium or an alkali metal peroxydiphosphate thereto.

3,651,210
SYNTHETIC EMULSION-GRAFT COPOLYMERS FURTHER REACTED WITH PROTEIN

Terry H. Shepler, St. Paul, Minn., and Donald S. Lord, Columbus, Ohio, assignors to Ashland Oil, Inc., Houston, Tex.

No Drawing. Filed May 15, 1970, Ser. No. 37,872
Int. Cl. C08f *29/36*
U.S. Cl. 424—78 **20 Claims**

The chemical reaction of a reactive synthetic emulsion and protein produces a co-polymer which is an excellent adhesive coating or film. This reactive synthetic emulsion—protein polymer is biodegradable in normal sewage facilities. It is an excellent coating material for leather and vinyl fabrics, because of its flexibility and semipermeability. The reactive synthetic emulsion is an interpolymer of: (1) ester of α,β-unsaturated carboxylic acid; (2) ester of an α,β-unsaturated carboxylic acid in which the ester portion contains an oxirane ring; (3) monoethenically unsaturated compound containing a vinyl group; (4) α,β-unsaturated mono- or di-carboxylic acid or salt thereof.

3,651,211
VIRUS INACTIVATION

William C. Gillchriest and William A. Brewer, Los Angeles, Calif., assignors to Lockheed Aircraft Corporation, Los Angeles, Calif.

No Drawing. Filed Oct. 16, 1967, Ser. No. 675,281
Int. Cl. A61k *23/00;* **C12k** *7/00*
U.S. Cl. 424—89 **4 Claims**

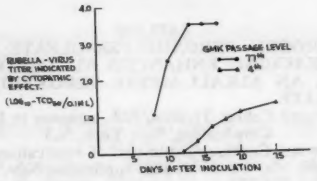
A chemical method is provided by which living viruses are biologically deactivated and thereafter restored to activity when desired. A sulfhydryl reagent is introduced to a critical site in the viral phospholipoprotein coat to arrest the activity of the organism. To restore biological activity, an appropriate metal atom is introduced to the site which competes with the sulfide for sulfide ions and thereby restores the protein coat to its original state.

3,651,212

ATTENUATED LIVE RUBELLA VIRUS VACCINE AND METHOD OF PRODUCTION

Harry M. Meyer, Jr., Silver Spring, and Paul D. Parkman, Kensington, Md., assignors to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare

Filer Dec. 20, 1966, Ser. No. 603,239
Int. Cl. C12k *5/00, 7/00*
U.S. Cl. 424—89 8 Claims



Production of an antigenically active, attenuated, live rubella virus vaccine by introducing a virulent live rubella virus into a monkey kidney tissue cell culture, incubating the tissue cell culture at a temperature compatible with growth of the tissue and the virus, harvesting a portion of the virus so-produced and reintroducing said harvested virus into fresh cultures, and repeating the tissue culture passages of the virus serially for a sufficient number of passages to produce the antigenically active, noncommunicable, live rubella virus and then forming a vaccine therefrom.

3,651,213

METHOD FOR THE IMMUNIZATION OF A LIVING ANIMAL BODY AGAINST VIRAL DISEASE

Craig Wallis and Joseph L. Melnick, Houston, Tex., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 29, 1969, Ser. No. 829,148
Int. Cl. A61k *27/00*
U.S. Cl. 424—89 7 Claims

Increased antibody production is obtained in a living animal body by injecting a living animal body susceptible to virus attack with a complex of a virus and a water-insoluble polyelectrolyte polymer containing basic groups. The polymer is polycationic or polyampholytic in nature and contains imide groups in the form of di-loweralkylaminoloweralkylimide groups or loweralkyl-iminodi(loweralkylimide) linkages. Exemplary of the virus-polyelectrolyte complex is the product of polio virus and a crosslinked dimethylaminopropylimide derivative of isobutylene/maleic anhydride copolymers.

3,651,214

ORALLY ADMINISTRABLE POLYVALENT VACCINES FOR INTESTINAL INFECTIONS

Hansjurgen Raettig, Berlin, Germany, assignor to Schering A.G., Berlin, Germany

No Drawing. Filed Aug. 7, 1969, Ser. No. 848,349
Claims priority, application Germany, Aug. 10, 1968, P 17 92 256.4
Int. Cl. A61r *27/00*
U.S. Cl. 424—92 10 Claims

For prophylactic immunization against a wide variety of local intestinal infections, e.g. salmonellal enteritis, there is provided an oral polyvalent vaccine composition containing a synergistic mixture of different inactivated vaccine types specific against different groups of microorganisms.

3,651,215

BACTERIAL MOSQUITO LARVA-KILLING AGENT

Satohiro Ibuki and Nobuo Fujiyoshi, Saitama-ken, Japan, assignors to Juro Morita, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 620,268, Mar. 3, 1967. This application Aug. 12, 1968, Ser. No. 751,750
Int. Cl. A01n *15/00*
U.S. Cl. 424—93 8 Claims

The present bacterial mosquito larva-killing agent comprises spores of *Bacillus cereus* var. *juroi* ATCC 21281 as an active ingredient and has a positive toxic effect only on mosquito larvae and is quite non-toxic to humans, cattle and fish.

The sufficiently effective spore concentration of the mosquito larva-killing agent is 10^{10} to 10^{11} spores per gram of the agent, and the agent can be used directly or in combination with a filler, emulsifier, or oleaginous liquid in any form such as powders, tablets, capsules or aqueous emulsions.

3,651,216

ANTIBIOTIC SUBSTANCES PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

Samuel Morris Ringel, Rockaway, Sidney Roemer, Parsippany, and Ann Lee Gutt, Passaic, N.J., and John E. Peterson, Columbia, Mo., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 11, 1970, Ser. No. 36,158
Int. Cl. A61k *21/00*
U.S. Cl. 424—115 7 Claims

The present invention discloses new antibiotics produced by the organism *Polyangium cellulosum* var. *fulvum*, Mishustin, 1938 (SMP–78). These antibiotics, designated as A, B and C, are effective against a variety of fungi, for example, *H. capsulatum*, *T. mentagrophytes*, etc.

3,651,217

ANTIBIOTIC EFFECTIVE AGAINST GRAM-POSITIVE BACTERIA AND METHOD OF PREPARATION

Alma W. Goldstein, Lake Bluff, and Joseph F. Prokop, Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of application Ser. No. 339,589, Jan. 23, 1964. This application Jan. 9, 1968, Ser. No. 696,548
Int. Cl. A61k *21/00*
U.S. Cl. 424—116 8 Claims

An antibacterial agent effective against gram positive bacteria made by the cultivation of various strains of the microorganism *Streptomyces impexus*.

3,651,218

ANTIFUNGAL COMPOSITIONS

Morris Emmanuel Stolar, Trumbull, and Assad Sami Sawaya, West Haven, Conn., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Continuation of application Ser. No. 742,494, July 5, 1968, which is a continuation-in-part of application Ser. No. 517,059, Dec. 28, 1965. This application June 3, 1970, Ser. No. 43,182
Int. Cl. A61k *21/00*
U.S. Cl. 424—120 3 Claims

Composition and process utilizing a combination of nystatin and an 8-hydroxyquinoline compound which combination shows antifungal activity when used as a dermatological.

3,651,219
ANTIBIOTIC INGRAMYCIN AND PROCESS FOR PREPARING THE SAME
Malcolm E. Bergy, Kalamazoo, Herman Hoeksema, Cooper, and Le Roy E. Johnson and Donald G. Kinch, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Sept. 27, 1968, Ser. No. 763,158
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 7 Claims

Antibiotic ingramycin is producible by culturing *Streptomyces maizeus* sp. nov. in an aqueous nutrient medium. Ingramycin inhibits the growth of *Staphylococcus aureus* and can be used as a disinfectant on washed and stacked food utensils contaminated with this bacterium.

3,651,220
RUGULOVASINE
Matazo Abe, Tokyo, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Apr. 17, 1969, Ser. No. 818,469
Claims priority, application Japan, Apr. 17, 1968, 43/25,687
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 10 Claims

Rugulovasine A and B, metabolites of Penicillium, Corticium, Pellicularia or Lenzites microorganisms, are hypotensor-active substances, useful in the treatment of high blood pressure. They are also useful in the treatment of bradycardia.

3,651,221
SUGAR SUBSTITUTE ADDITIVE PREPARATIONS OF SORBITOL AND GLUCONIC ACID
Ernst Conrad, Lyckeby, and Olof Theander, Vallingby, Sweden, assignors to Lyckeby Starkelseforadling AB, Lyckeby, Sweden
No Drawing. Filed May 14, 1970, Ser. No. 37,304
Claims priority, application Sweden, May 19, 1969, 7,039/69
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 14 Claims

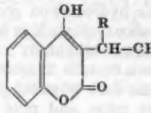
The present invention relates to the preparation of a modified saccharide material containing a combination of sugar alcohol and gluconic acid units which is suitable as an additive in foodstuffs and drugs. The process is characterized by partially hydrolysing an aqueous starch slurry, preferably of potato starch or corn starch, to a DE value of 5–60%, preferably up to 50% by acid and/or enzymatic hydrolysis to the formation of mono, di and higher oligosaccharides as well as dextrines, partial and specific oxidation of reducing glucose units to gluconic acid units, preferably to 25–70%, the present mono and/or disacharides being removed by fermentation to alcohol before or after the oxidtaion, partly or completely hydrogenating the remaining glucone units to sorbitol units and, if required, adjusting the pH to a suitable value, if desired after having partly or completely removed the cations and after neutralization of the acids with a base of a suitable metal and, finally, concentration or complete evaporation of the product.

3,651,222
NEMATOCIDAL USE OF SUBSTITUTED DIMETHYLSULFONIUM TETRAPHENYLBORATES
Abron B. Gee, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Sept. 15, 1969, Ser. No. 858,181
Int. Cl. A01n *9/12*
U.S. Cl. 424—185 8 Claims

Nematocidal use of substituted dimethylsulfonium tetraphenylborates which are produced by reacting a substituted dimethylsulfonium halide with a sodium tetraphenylborate.

3,651,223
ANTICOAGULATING COMPOSITIONS CONTAINING NEW DERIVATIVES OF 4 - HYDROXY COUMARINE
Eugene Boschetti, Venissieux, Darius Molho, Boulogne-sur-Seine, and Louis Fontaine, Lyon, France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique
No Drawing. Original application Dec. 11, 1967, Ser. No. 689,347, now Patent No. 3,574,234, dated Apr. 6, 1971. Divided and this application June 11, 1970, Ser. No. 45,589
Claims priority, application France, Dec. 13, 1966, 82,213; Nov. 13, 1967, 127,915
Int. Cl. A61k *27/00*
U.S. Cl. 424—275 6 Claims

4-hydroxy coumarines represented by the formula



in which R is a member of the group formed by the thienyl, methylthienyl, halothienyl and nitrothienyl radicals; and R_1 is a member of the group formed by the methyl, phenyl, halophenyl, nitrophenyl, diphenyl, halodiphenyl and nitrodiphenyl radicals, and processes for their preparation.

3,651,224
PESTICIDAL PYRIMIDINE DERIVATIVE
Stuart Peter Sharpe and Brian Kenneth Snell, Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Sept. 9, 1968, Ser. No. 758,579
Claims priority, application Great Britain, Sept. 21, 1967, 43,133/67
Int. Cl. C07d *51/42*
U.S. Cl. 424—200 3 Claims

O(2-diethylamino-4-methyl - 6 - pyrimidinyl) O,O dimethyl phosphorothioate. This compound has pesticidal properties and is characterized by its extremely low toxicity to mammals. Pesticidal compositions and methods of using the same to combat pests are also disclosed. The acid addition salts of the indicated compound may also be used.

3,651,225
SYNERGISTIC INSECTICIDAL AND NEMATOCIDAL COMPOSITIONS
Fred Morris Gordon, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed June 10, 1969, Ser. No. 831,997
Int. Cl. A01n *9/36*
U.S. Cl. 424—200 3 Claims

A synergistic insecticidal, and nematocidal composition is given containing an alkylmercaptoalkyl O,O-dialkyldithiophosphate and a dialkyl pyrazinyl phosphorothioate. More particularly, this invention relates to compositions of O,O-diethyl S-(ethylthio)methyl phosphorodithioate and O,O-diethyl O-(2-pyrazinyl) phosphorothioate wherein said components are present in the ratio of about 2 to 10 parts of O,O-diethyl S-(ethylthio)methyl phosphorodithioate to 1 part of O,O-diethyl O-(2-pyrazinyl) phosphorothioate and the efficacy of each of said compounds is inordinately enhanced by the presence of the other.

3,651,226

MITICIDAL COMPOSITIONS CONTAINING PHENYLAZOPROPENOATE ESTERS AND METHODS OF USE

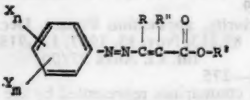
Robert Earl Sticker, Middleport, N.Y., assignor to FMC Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 777,200, Nov. 19, 1968, which is a continuation-in-part of application Ser. No. 712,351, Mar. 12, 1968. This application Mar. 18, 1970, Ser. No. 20,839

Int. Cl. A01n *9/20*

U.S. Cl. 424—226 **10 Claims**

A new class of miticides comprises phenylazopropenoate esters of the formula



wherein R is hydrogen or an aliphatic group having one to three carbon atoms inclusive; R'' is hydrogen or methyl; R' is a lower aliphatic hydrocarbon group, saturated or unsaturated, or lower alkoxyalkyl; X is halogen, lower alkyl, lower alkoxy, or lower alkylthio; Y is methyl or chloro; *n* is 0 or 1; and *m* is 0, 1, or 2. Synthesis of many of this class of compounds, their physical properties, and their effectiveness against mites and mite eggs are described.

3,651,227

VETERINARY COMPOSITIONS AND METHODS

John S. Sickles, Portola Valley, Calif., assignor to Syntex Corporation, Apartado, Panama

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,167

Int. Cl. A61k *27/00*

U.S. Cl. 424—238 **7 Claims**

Compositions containing and methods employing a corticosteroid for stimulating growth and lactation in domestic animals. 6α,9α-difluoro-16α-methylpregna-1,4-diene-11β,17α,21-triol-3,20-dione is illustrated as representative of the useful corticosteroid class.

3,651,228

17 - TERTIARY AMINOALKOXYIMINOANDROSTANES FOR CONTROLLING PATHOGENIC FUNGI INFECTIONS

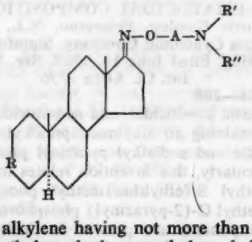
Wataru Nagata, Nishinomiya, and Haruo Nishimura, Ashiya, Japan, assignors to Shionogi & Co., Ltd., Higashi-ku, Osaka, Japan

No Drawing. Application Oct. 11, 1968, Ser. No. 766,944, now Patent No. 3,492,317, dated Jan. 27, 1970, which is a continuation-in-part of application Ser. No. 493,880, Oct. 7, 1965. Divided and this application Nov. 6, 1969, Ser. No. 871,257

Int. Cl. A61k *17/00*

U.S. Cl. 424—238 **4 Claims**

17 - tertiary aminoalkoxyiminoandrostanes of the formula:



wherein A is alkylene having not more than five carbon atoms, R is methylene, hydroxymethylene, halogenomethylene or carbonyl, R' and R'' are each alkyl having not more than three carbon atoms or, when taken together with the adjacent nitrogen atom, they represent a five- or six-membered saturated nitrogen-containing heterocyclic ring which is unsubstituted or substituted with alkyl having not more than three carbon atoms, and where a double bond can be present between the 2- and 3-positions, and salts thereof are useful as anti-fungal agents.

3,651,229

2-METHYL - 3-AMIDINO-QUINOXALINE-1,4-DI-N-OXIDES AS ANTIBACTERIAL AGENTS AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAID OXIDES

Kurt Ley, Odenthal-Globusch, Ulrich Eholzer, Cologne-Stammheim, and Karl Georg Metzger, Wuppertal-Elberfeld, Germany (all % Farbenfabriken Bayer AG, Leverkusen, Germany), and Dieter Fritsche, Wuppertal-Vohwinkel, Germany (Lindenthal, Krielerstr 74, Cologne, Germany)

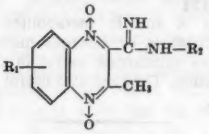
No Drawing. Original application Oct. 2, 1968, Ser. No. 764,612. Divided and this application Nov. 12, 1969, Ser. No. 871,282

Claims priority, application Germany, Oct. 4, 1967, F 53,668

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **19 Claims**

Pharmaceutical compositions comprising 2-methyl-3-amidino-quinoxaline-1,4-di-N-oxides of the formula:



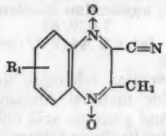
(I)

wherein:

R_1 is hydrogen, lower alkyl, lower alkoxy or chlorine, and

R_2 is hydroxy or amino,

in combination with a pharmaceutically acceptable insert carrier are useful as antibacterial agents.



(II)

These compositions or the active compound can be administered subcutaneously or orally to humans and animals.

3,651,230

COMPOSITIONS AND METHODS FOR TRANQUILIZING WITH SUBSTITUTED 3-PHENYL-4-QUINAZOLINONE DERIVATIVES

Hisao Yamamoto and Shigeho Inaba, Nishinomiya, Seitetsu Arasaki and Isamu Maruyama, Minoo, Kei Takahaski, Takarazuka, Chiharu Saito, and Shigeru Sakai, Toyonaka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

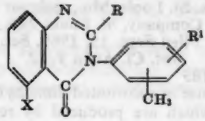
No Drawing. Continuation-in-part of application Ser. No. 871,241, June 27, 1969, which is a division of application Ser. No. 680,046, Nov. 2, 1967. This application Apr. 29, 1970, Ser. No. 33,079

Claims priority, application Japan, Nov. 15, 1966, 41/75,386

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 **5 Claims**

A tranquilizing agent comprising an effective amount of a quinazolinone derivative of the formula



wherein R is an ethyl or propyl group, R^1 is a halogen atom, and X is a halogen atom, and a pharmaceutically acceptable carrier. The tranquilizer exhibits potent sedative activity with minimal hypnotic and toxic activity.

3,651,231

PROCESS FOR PREPARING LACTOGENIC FACTOR

Samuel H. Eppstein, Charleston Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 362,938, Apr. 27, 1964, now Patent No. 3,275,516, and a continuation of application Ser. No. 522,401, Jan. 24, 1966. This application Sept. 10, 1969, Ser. No. 857,643

Int. Cl. A61k *17/08*

U.S. Cl. 424—108 2 Claims

An improved process for the purification of lactogenic factor of porcine pituitaries utilizes a combination of simple elution chromatography and displacement chromatography to provide greater chromatographic selectivity and resolution of components.

3,651,232

COMPOSITIONS AND METHODS FOR LOWERING BLOOD SUGAR LEVELS

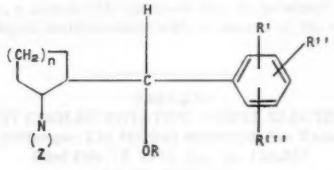
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 556,892, June 13, 1966. This application Sept. 10, 1968, Ser. No. 758,664

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 22 Claims

Therapeutic composition and method for stimulating insulin secretion, reducing the blood sugar level and treating diabetes wherein the principal active ingredient is a compound of the formula:



wherein *n* has the value of 1 to 4, inclusive, wherein

—NZ represents a heterocyclic amino radical containing from 5 to 10 nuclear atoms, inclusive, wherein R is alkyl containing from 1 to 6 carbon atoms, inclusive, wherein R′, R″ and R‴ are selected from the group of substituents consisting of hydrogen, halogen, alkyl and alkoxy containing from 1 to 6 carbon atoms, inclusive, and —CF_3, the acid addition salts, N-oxides and alkyl quaternary ammonium halide salts thereof, in which the alkyl group has from 1 to 12 carbon atoms, inclusive.

3,651,233

METHODS FOR TREATING POSTOPERATIVE GASTROINTESTINAL CONDITIONS WITH 5-HYDROXYTRYPTAMINE

Jeanette L. Rubricius, Jamaica, N.Y., assignor to Beecham Group Limited, Brentford, Middlesex, England

No Drawing. Filed Oct. 3, 1969, Ser. No. 864,300

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 3 Claims

An orally administrable composition is provided for the treatment of postoperative gastrointestinal conditions such as paralytic ileus and abdominal distention. The active agent is 5-hydroxytryptamine which is administered in tablet form with suitable excipents in the amount of 2.5 to 25 mg., preferably in the unit dosage amount of 5 milligrams. The composition may also contain a potentiating amount of a parasympatheticomimetic agent such as neostigmine.

3,651,234

MICROBIOCIDAL 1,2-DITHIOLONES HAVING SULPHUR CONTAINING SUBSTITUENTS AND METHODS OF CONTROLLING FUNGI AND BACTERIA THEREWITH

Jorg Bader, Alsheim, Basel-Land, and Karl Gatzi, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Application June 5, 1967, Ser. No. 643,359, now Patent No. 3,546,235, dated Dec. 8, 1970, which is a continuation-in-part of application Ser. No. 555,994, June 8, 1966. Divided and this application Aug. 5, 1970, Ser. No. 61,393

Claims priority, application Switzerland, June 15, 1966, 8,566/65

Int. Cl. A01n *9/12, 9/22;* C07d *31/50*

U.S. Cl. 424—277 8 Claims

1,2-dithiol-3-ones having substituents which comprise certain organic radicals bonded to the 5-position of the dithiolone nucleus via a sulphur atom which may be mono- or dioxidized, which are of excellent microbicidal activity especially against fungi and bacteria; a novel process for the production of those of the new compounds in which the bridge is a sulphur or mono-oxidized sulphur bridge; methods of inhibiting microbial growth with the aid of the novel compounds, and antimicrobial compositions containing the latter as active ingredients.

3,651,235

ANTIBACTERIAL THERAPEUTIC COMPOSITION CONTAINING THIAMPHENICOL DERIVATIVE

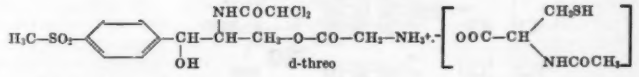
Uberto M. Teotino, Milan, Italy, assignor to Whitefin Holding S.A., Lugano, Switzerland

No Drawing. Original application Mar. 9, 1966, Ser. No. 532,883, now Patent No. 3,542,854, dated Nov. 24, 1970. Divided and this application Mar. 31, 1970, Ser. No. 24,333

Int. Cl. A61k *27/00*

U.S. Cl. 424—311 2 Claims

A new thiamphenicol derivative has been prepared, having the formula:



which is water-soluble, tasteless, odorless and exercises a strong mucolytic action as well as an antibacteric action higher than that of the thiamphenicol, with respect to many microorganisms which are responsible for respiratory diseases.

3,651,236

METHOD FOR INHIBITING HISTAMINE FORMATION

Robert Gerard Kelly, Monsey, and Leon Ellenbogen, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 811,661, Mar. 28, 1969. This application Nov. 20, 1970, Ser. No. 91,579

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 5 Claims

This disclosure describes compositions of matter useful for inhibiting the formation of histamine in mammals and the method of inhibiting histamine formation in mammals therewith, the active ingredients of said compositions of matter being 4-bromo-3-hydroxybenzyl alcohol and/or 4-bromo-3-hydroxybenzoic acid.

3,651,237

TREATING OF AGGRESSION AND REDUCTION OF FATIGUE SYNDROMES WITH L-TYROSINE

Henri Laborit, Paris, France, assignor to Centre d'Etudes Experimentales et Cliniques de Physiobiologie de Pharmacologie et d'Eutonologie

No Drawing. Filed Feb. 11, 1970, Ser. No. 10,658

Int. Cl. A61k *27/00*

U.S. Cl. 424—319 1 Claim

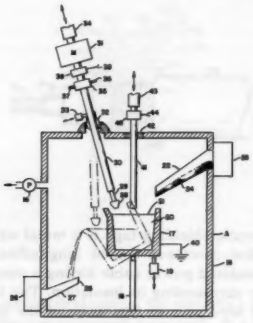
A pharmaceutical composition for the treatment of shock which comprises L-tyrosine in a 5 to 10% solution of glucose in water, which composition when administered brings about the restoration of a working reserve of catecholamines and thus maintains normal metabolic activity. The administration of the composition acts to relieve symptoms of body fatigue in mammals.

ELECTRICAL

3,651,238
ARC FURNACE ELECTRODE WHEEL MOUNTING SYSTEM

Max P. Schlienger, 19 Rollingwood Drive, San Rafael, Calif.

Filed July 17, 1970, Ser. No. 55,869
Int. Cl. H05b *7/10, 7/12*
U.S. Cl. 13—9 10 Claims

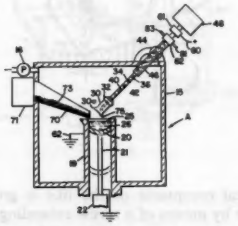


An arc furnace having a rotating electrode wheel which is pivotably and extendably mounted to permit arc formation in any desired area of the melt. Preferably, the electrode wheel mounting structure is disposed outside of the vertical projection of the melt, so that the electrode wheel will be inclined with respect to the melt regardless of the position of the electrode wheel with respect thereto. Furthermore, the electrode wheel may be so mounted adjacent the pouring end of the crucible, so that when the crucible is poured, the electrode wheel may be positioned for arc heating during pouring. In addition, a consumable electrode may be provided and may be employed simultaneously with, or instead of, the electrode wheel.

3,651,239
POINT COOLED ROTATING WHEEL ELECTRODE

Max P. Schlienger, 136 Mitchell Boulevard, San Rafael, Calif.

Filed Feb. 18, 1971, Ser. No. 116,430
Int. Cl. H05b *7/08*
U.S. Cl. 13—18 11 Claims

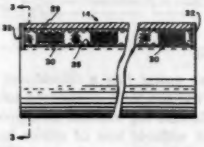


An improved coolant distribution system for a rotating non-consumable electrode wheel in an arc melting furnace. A rotating tubular drive shaft suspends the electrode wheel above the melt surface in an obliquely inclined orientation whereby successive portions of the wheel periphery are brought into arc-forming proximity to the melt surface as the wheel is rotated. A non rotating nozzle is positioned within the electrode wheel with its discharge orifice in heat dissipating proximity to the interior surface of the wheel at the portion of the wheel periphery in arc-forming proximity to the melt at any given instant.

3,651,240
HEAT TRANSFER DEVICE

Milton E. Kirkpatrick, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of application Ser. No. 637,193, May 9, 1967, now abandoned. This application Jan. 31, 1969, Ser. No. 797,725
Int. Cl. H05b *3/66;* F28d *15/00*
U.S. Cl. 13—22 17 Claims

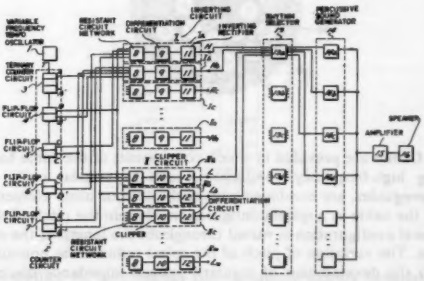


Spaced inner and outer tubes form a closed annular chamber whose inner surfaces contain coverings of wick material that are interconnected through vane-like wicks. The wick material transports a vaporizable working fluid from cold areas where the vapor condenses to warm areas where the fluid vaporizes. An isothermal working space is produced within the central volume bounded by the inner tube and along its entire length, which may be used to advantage for oven or furnace applications or for providing an isothermal jacket.

3,651,241
AUTOMATIC RHYTHM PERFORMANCE DEVICE

Ikutaro Kakehashi, c/o Ace Electronic Industries, Inc., 75-17 Kitajima-cho, Sumiyoshi-ku, Osaka-shi, Japan

Filed June 3, 1971, Ser. No. 149,464
Claims priority, application Japan, June 10, 1970, 45/50566
Int. Cl. G10f *1/00*
U.S. Cl. 84—1.03 1 Claim

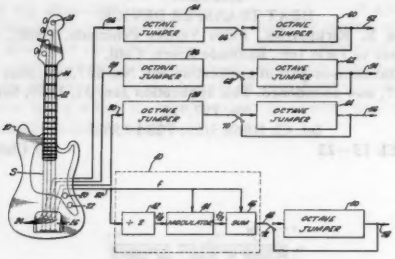


A plurality of inverting circuits and/or clipper circuits are connected to a counting circuit to synthesize the output signal of the counting circuit. The synthesized output signal becomes a desired rhythm.

3,651,242
OCTAVE JUMPER FOR MUSICAL INSTRUMENTS

Chauncey R. Evans, Costa Mesa, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed June 15, 1970, Ser. No. 46,249
Int. Cl. G10h *1/06, 3/00*
U.S. Cl. 84—1.11 26 Claims

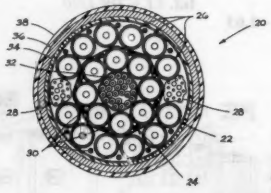


A bass or other guitar has a transducer for each of its strings, and each transducer is connected to an octave jumping circuit which lowers the musical tone produced by the individual string, all without loss of either harmonics or amplitude variations. The wave form of the fundamental frequency of each musical tone is squared, divided by two and then amplitude modulated to follow the amplitude envelope of the original tone. The modulated square wave contains only odd harmonics of the lowered frequency fundamental. The missing even harmonics are restored by combining with the modulated square wave the original tone containing all of its harmonics.

3,651,243
HIGH-FREQUENCY CABLES

Eugene M. Hornor, Rosedale, and William J. Hyde, Baltimore, both of Md., assignors to Western Electric Company, Incorporated, New York, N.Y.

Original application Aug. 30, 1968, Ser. No. 756,541. Divided and this application Apr. 29, 1970, Ser. No. 32,987
Int. Cl. H01b *11/02*
U.S. Cl. 174—34 16 Claims

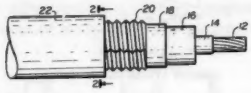


Cables are provided in which components of the cable having high-frequency conductors, such as coaxial units or waveguides, are combined with each other or other elements of the cable in a spiral configuration wherein the pitch of the spiral configuration is varied throughout the length of the cable. The variation of pitch of the spiral reduces the potential for the development of regularly spaced impedance discontinuities which can cause high reflection losses of energy in the coaxial or waveguide-type components in situations where the cable has been slid or rolled across a rigid surface. Undesirable secondary effects associated with a periodicity of variation in the spiral configuration can be reduced by employing a sinusoidal pattern in varying the pitch of the component in the cable.

3,651,244
POWER CABLE WITH CORRUGATED OR SMOOTH LONGITUDINALLY FOLDED METALLIC SHIELDING TAPE

David A. Silver, Roslyn, N.Y., and George Bahder, Edison, N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Oct. 15, 1969, Ser. No. 866,589
Int. Cl. H01b *9/02*
U.S. Cl. 174—36 12 Claims

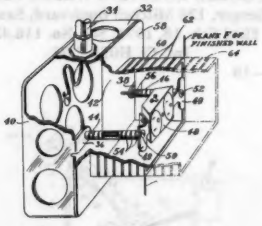


This electrostatic shielding tape is a metal strip of low resistance and low reactance folded longitudinally over the length of an insulated power cable having a semi-conducting insulating layer surrounding its insulation. The longitudinally folded metallic tape permits expansion of the insulation and insulation shield, located directly under it, without significant deformation of the insulation and the insulation shield. When the tape is of a metal requiring a thin corrosion-protective coating, the coating on the side adjacent to the insulation shield is preferably semi-conducting to accept charging current from the insulation. It is a feature that the metal of the electrostatic shield is in electrical communication with the insulation shield.

3,651,245
JUNCTION BOX AND GROUNDING MEANS THEREFOR

Oswin C. Moll, 1640 Chippendale Circle, Bethlehem, Pa.

Filed Dec. 22, 1969, Ser. No. 887,077
Int. Cl. H05k *5/02*
U.S. Cl. 174—51 9 Claims



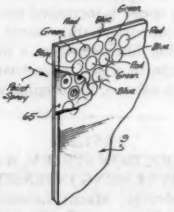
An electrical receptacle or the like is grounded directly and positively by means of a screw extending through axially shortenable spacer means positioned between the metallic frame of the receptacle and a portion of the metallic junction box on which it is mounted. The junction box is also provided with a cover member having a tubular portion whose length can be reduced as required in order to provide a plane that is substantially flush with the finished wall surface.

The aforementioned abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,651,246
ELECTRO-MECHANICAL COLOR REPRODUCTION SYSTEM

Ramon Bergero, Los Angeles, Calif., assignor to BSR Optronics Corporation

Filed Aug. 25, 1969, Ser. No. 862,588
Int. Cl. H04n 1/46
U.S. Cl. 178—5.2 R 16 Claims

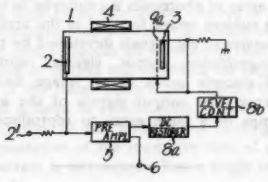


An electro-mechanical system for preparing a color matrix for the reproduction of images appearing on a color positive transparency, the matrix defining a pattern of identical red, blue and green spot groupings similar to that utilized in color television interlace scanning, wherein points on the color transparency are selected in accordance with the spacing of the matrix spot groups, these points being optically scanned and the red, blue and green color component intensities at each point detected and used to determine the areas of the similarly colored spots in the corresponding matrix spot group to be blackened in accordance with a color subtraction technique.

3,651,247
VIDEO SIGNAL GENERATING APPARATUS

Takashi Okada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 27, 1970, Ser. No. 40,781
Claims priority, application Japan, May 31, 1969, 44/42810
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST 6 Claims

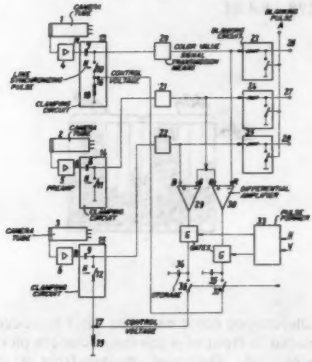


An illustrative embodiment of the invention converts two field-sequential color television signals to dot-sequential signals for combination into a composite color television signal. Through a feedback circuit connected to a field-sequential responsive image tube, a portion of the signal that characterizes one color is stored on the tube target while the image for another color is registered. This combined field sequential signal is taken from the target and is processed with another delayed field-sequential signal to provide two simultaneous dot-sequential signals.

3,651,248
BLACK LEVEL CLAMPING BY COLOR SIGNAL DIFFERENCE GATED TO STORAGE DURING BEAM BLOCKING

Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Jan. 7, 1970, Ser. No. 1,154
Claims priority, application Germany, Jan. 11, 1969, P 19 01 296.5
Int. Cl. H04n 5/18
U.S. Cl. 178—5.4 R 10 Claims

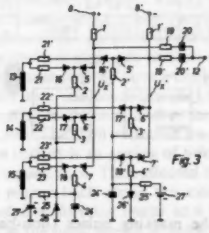


A system for controlling the black level value of primary color signals by comparing the black levels of two primary signals with that of a third primary signal to generate difference signals, and gating these difference signals into respective clamping circuits for feedback control of the black level values.

3,651,249
METHOD OF REPRODUCING POLYCHROMATIC PICTURE ORIGINALS

Hans Keller, Kiel-Wik, Germany, assignor to Dr.-Ing. Rudolf Hell

Filed Feb. 16, 1970, Ser. No. 11,702
Claims priority, application Germany, Feb. 25, 1969, P 19 09 292.3
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 R 6 Claims



A method of reproducing polychromatic picture originals employs the continuous comparison of color separation voltages derived by means of an interposed color separation filter system and extraction of the smallest voltage at any one time of the color signal voltages for producing a white separation. The white separation is superimposed on the color separation as a mask, preferably a highlight mask, wherein only those portions of the white separation voltage which exceed a

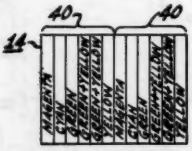
predetermined threshold value are utilized for the highlight mask. The white separation may also advantageously be employed in the reproduction of negative picture originals as a negative black separation.

3,651,250

TELEVISION CAMERA UTILIZING A PARALLEL-STRIPED COLOR ENCODING FILTER

Robert Adams Dischert, Burlington, N.J., assignor to RCA Corporation

Filed June 30, 1969, Ser. No. 837,651
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 ST **19 Claims**



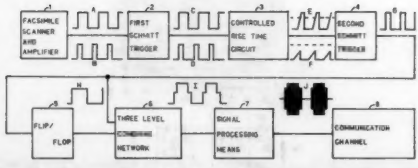
A parallel-striped color encoding filter balanced for white light is placed in front of a television camera pickup tube to encode scene light. The signal obtained from the pickup tube is decoded electrically to yield two color difference signals which may be matrixed to produce signals representative of the red, green and blue light from the scene. The average transmission of the encoding filter produces low frequency components which are representative of the brightness of the scene.

3,651,251

FACSIMILE SIGNAL MODIFICATION REDUCING THE INFORMATION CHANNEL BAND-WIDTH

John H. Clark, Northport, N.Y., assignor to International Scanatron Systems Corp., Wyandanch, N.Y.

Filed May 1, 1970, Ser. No. 33,652
Int. Cl. H04n *7/10;* **H04h** *7/12*
U.S. Cl. 178—6 **6 Claims**



Shortening the marking pulses (non-background) by an amount equal to the shortest pulse which the system is intended to pass improves the performance of the three level, band-width reducing system described in the application entitled "Facsimile Signal Modification Reducing the Information Channel Band-Width" filed on Dec. 21, 1967 and bearing Ser. No. 701,511 now U.S. Pat. No. 3,588,330.

As pointed out in the above referred to patent the three level signal generated in accordance with the disclosure is asymmetric with the background being represented by the outside pair of levels and the line information as the center level. This mode of operation results in a system wherein the band-width required for background-to-background transitions is halved. In such a system, however, closely spaced black to white transitions in series approach the symmetrical alternating condition and therefore are passed with varying efficiency. For transitions representing small segments of background in a field of markings, no band-width compression occurs. This causes a deficiency in the actual copy.

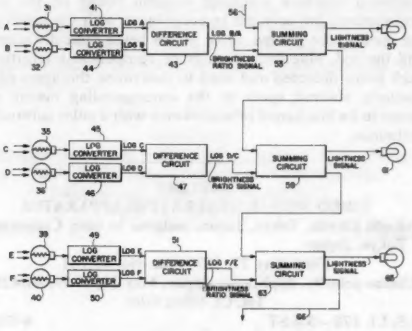
Another characteristic of the original system described in the above referred to application is that modulation depth varies as the keying speed is increased above a certain point. Note that for a symmetrical three level wave the channel band-width restriction filters process a three level signal at the limit of resolution to a sine wave having a peak-to-peak value of one-half the value of the original wave.

3,651,252

IMAGE REPRODUCTION SYSTEM WHICH DETECTS SUBJECT BY SENSING INTENSITY RATIOS

Edwin Land, Cambridge, Mass.; Leonard A. Ferrari, San Dimas, Calif.; Sholly Kagan, Natick, and John J. McCann, Belmont, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 22, 1970, Ser. No. 4,895
Int. Cl. H04n *5/30;* **H01j** *39/12*
U.S. Cl. 178—6 **19 Claims**



This specification discloses an image reproduction system in which an array of photocells is employed to sense intensity ratios in the subject image focused in the array. An analog circuit responsive to the signals developed by the photocells produces logarithmic output signals representing the lightness of discrete areas in an image focused on the photocell array. The output signals of the analog system energize lamps of a lamp array to reproduce the subject image.

3,651,253

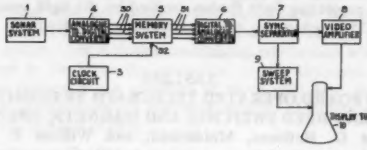
VISUAL DISPLAY SYSTEM WITH DIGITAL STORAGE OF VIDEO INFORMATION

Jean Paul Morgand; Henri Magnan, and Bernard Romagny, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 17, 1970, Ser. No. 12,078
Claims priority, application France, Feb. 20, 1969, 6904287; Dec. 17, 1969, 6943699
Int. Cl. G08b *5/22;* **H04n** *5/76, 7/12*
U.S. Cl. 178—6.6 A **12 Claims**

A visual display system for visualizing an image represented by a video signal comprising an analogue-to-

digital converter for translating this video signal into a digital signal, a memory for storing this digital signal while supplying



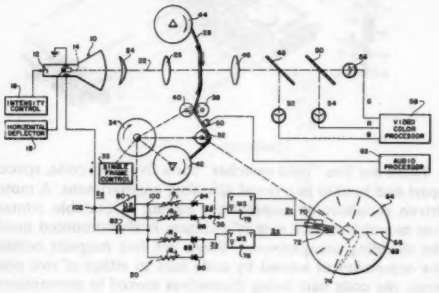
it continuously and a digital-to-analogue converter connected to the memory and restituting an analogue image signal to a conventional display tube.

3,651,254

SCANNING APPARATUS RESPONSIVE TO THE MOVEMENT OF IMAGE BEARING MEDIA

Lenard M. Metzger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,502
Int. Cl. H04n *5/36*
U.S. Cl. 178—7.2 **18 Claims**



The frames of a continuously moving image bearing medium are scanned in a raster pattern to produce an image signal representative thereof, the raster pattern being generated in accordance with the detected rate of movement of the image bearing media. The rate of movement may be detected from the movement of sprocket holes or indicia associated with image bearing frames on the information bearing media or from the synchronized rotation of a disc bearing indicia and synchronized with the movement of the information bearing media. Signals are developed from the detected sprocket holes or indicia that establish the repetitive rate of production of the raster pattern and control the positioning of the raster pattern in synchronism with the movement of the image frames of the information bearing media. The signal representative of the repetitive rate of production of the raster pattern is developed when a single image frame is to be scanned.

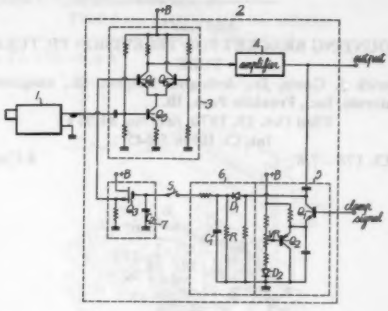
3,651,255

AUTOMATIC GAIN CONTROL SYSTEM FOR TELEVISION CAMERAS

Yasuharu Kubota, Kanagawa-ken, and Takashi Shiono, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 17, 1970, Ser. No. 12,069
Claims priority, application Japan, Feb. 22, 1969, 44/13410
Int. Cl. H04n *5/19*
U.S. Cl. 178—7.2 R **4 Claims**

An automatic gain control system for television camera which has an amplifier circuit and a memory circuit for selecting the gain of the amplifier in response to a signal ap-



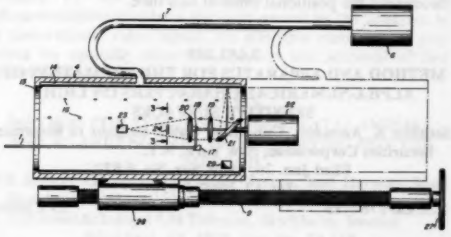
plied thereto. The memory circuit stores the signal selectively applied thereto with a manual switch.

3,651,256

LASER DOCUMENT TRANSLATOR

Randy J. Sherman, Phoenix, and Jerald F. Hanson, Tempe, both of Ariz., assignors to McCown Laboratories, Inc.

Filed Nov. 19, 1970, Ser. No. 91,117
Int. Cl. H04n *3/08*
U.S. Cl. 178—7.6 **5 Claims**



A laser page scanner is disclosed in which the information bearing sheet to be scanned is disposed in a cylinder which translates axially past an opto-mechanical scanning apparatus fixed coaxially within the cylinder. A laser beam is directed from outside the cylinder along a path parallel to the cylinder axis into the interior of the cylinder where it is redirected by relay mirrors to the cylinder axis and to a rotating mirror which reflects the beam radially outwardly whereby the beam scans the cylinder in a continuous circle. As a result of the longitudinal translation of the cylinder, the document is, in effect, line scanned. The light reflected back to the rotating mirror at a given instant is an analog of information which is present at the scanned spot. The reflected light is redirected by the rotating mirror back along the axis of the cylinder through a pair of spot forming lenses to a first photo-diode which is utilized as the input sensor to suitable electronics for storing or reproducing the scanned information. A second photo-diode is fixed radially outwardly from the rotating mirror in order to intercept the laser beam once each revolution of the rotating mirror to provide a synch signal. A circular mask is disposed between the first photo-diode and the nearest spot forming lens to prevent a selected core portion of the beam from reaching the photo-diode to improve the signal-to-noise ratio. In order to simplify the optical system, one of the relay mirrors is cemented to the center of the spot

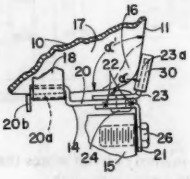
forming lens nearest the first photo-diode to redirect the laser beam through the other spot forming lens before it impinges on the rotating mirror.

3,651,257

MOUNTING BRACKET FOR TELEVISION PICTURE TUBE

Frederick J. Goetz, Jr., Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 19, 1970, Ser. No. 81,971
Int. Cl. H04n *5/645*
U.S. Cl. 178—7.8 **8 Claims**



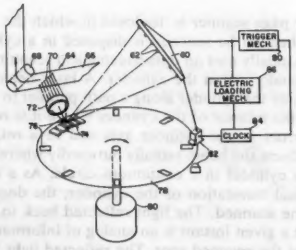
A mounting bracket for mounting a television picture tube in a housing of the type in which the bracket is securable to the housing and is adapted to support the side of the tube, the bracket having a pivotable portion for supporting the peripheral edge of the front screen of the tube. The pivotable portion is pivotable in conformance with positional shifts of the tube and is coverable with a shock-absorbent hood for providing a soft engaging contact with the front screen over an area of contact, which area is substantially maintained throughout the positional shifts of said tube.

3,651,258

METHOD AND APPARATUS FOR THE FORMATION OF ALPHA-NUMERICAL CHARACTERS ON LIGHT SENSITIVE SURFACES

Stephen K. Ammann, Cupertino, Calif., assignor to Bessemer Securities Corporation, New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,822
Int. Cl. H04l *15/34*
U.S. Cl. 178—15 **19 Claims**



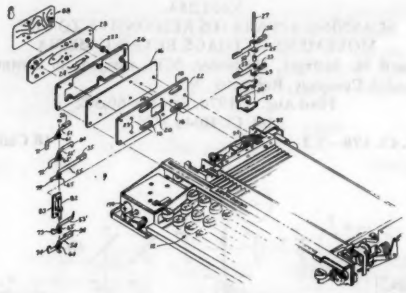
A high speed line printer for recording computer outputs and the like on light sensitive materials. A light source capable of blinking at high frequencies is provided for each character space on the print-out line and is projected onto a corresponding character field on the material. The material is moved in the X-direction and the projected image of the light sources is moved in the Y-direction across the width of the corresponding character field by a mirror to form scan lines which are spaced in the X-direction. The light sources are selectively energized whenever the projected images are at predetermined X, Y positions to thereby simultaneously form all characters in a given print-out line. The apparatus provides means for moving the light sensitive material, mounting the light sources, projecting the light source images onto the film and moving the projected images in the Y-direction while projecting light flashes emitted by the light sources to form 35-bit character matrixes in each character field.

3,651,259

KEYBOARD OPERATED TELEGRAPH TRANSMITTER USING REED SWITCHES AND MAGNETIC SHUNTS

Ernest G. Hoffman, Middlefield, and William P. Ryan, Bethany, both of Conn., assignors to Mite Corporation, New Haven, Conn.

Filed Nov. 12, 1968, Ser. No. 775,076
Int. Cl. H04l *15/12*
U.S. Cl. 178—17 C **17 Claims**



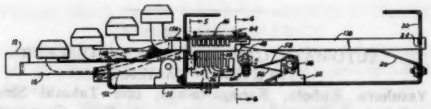
There are five "reed switches" for a five level code, spaced apart and housed in a metal shielding compartment. A motor driven serializer or commutator having a rotatable contact arm movable over a ring of contacts is also mounted inside the shielding compartment. There are five magnets outside the compartment moved by code bars to either of two positions, the code bars being themselves moved in conventional fashion by the keys of the keyboard. One magnet position is close to its related switch, and serves to close the switch, and the other magnet position is more remote and causes opening of its switch. The magnetic differential between the two positions of the movable magnets is increased by the provision of a magnetic shunt adjacent the retracted positions of the magnets.

3,651,260

KEYBOARD OPERATED TRANSMITTER

Timothy F. Donovan, Huntington, and William P. Ryan, Bethany, both of Conn., assignors to Mite Corporation, New Haven, Conn.

Filed Sept. 4, 1969, Ser. No. 855,260
Int. Cl. H04l *17/12*
U.S. Cl. 178—17 C **15 Claims**



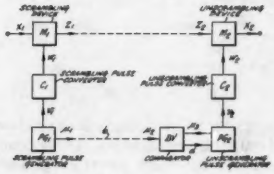
A keyboard operated telegraph transmitter having an array of keys is provided. The transmitter includes a plurality of code bars which are shiftable by the depression of the keys and also includes switching means operatively connected to and actuated by the shifting of the code bars. The switching

means includes a circuit board having a plurality of conductive areas positioned on a surface thereof, and a contact means which is secured to each of the code bars and electrically connects several of the conductive areas on the circuit board. When the code bars are shifted the movement is transformed into an output coded signal from the circuit board. Additional features of the transmitter include a parity check system, and a motion multiplying mechanism which is designed to facilitate the operation of the keyboard. Still another feature is the inclusion of three shift keys for the purpose of transmitting a maximum number of indicia with a minimum number of keys.

3,651,261
MESSAGE SCRAMBLING APPARATUS FOR USE IN PULSED SIGNAL TRANSMISSION

Gustav Guanella, Zurich, Switzerland, assignor to Patelhold Patentverwertungs-und Elektro-Holding AG, Glarus, Switzerland

Filed Aug. 5, 1965, Ser. No. 477,504
Claims priority, application Switzerland, Aug. 6, 1964, 10308/64
Int. Cl. H04l 9/02
U.S. Cl. 178—22 **7 Claims**

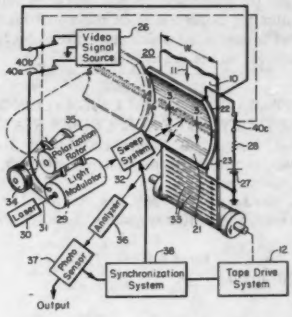


A pair of binary counters controlled by identical clock pulses are synchronized by means of a plurality of comparison devices in the form of exclusive OR-circuits having their inputs excited each by a pair of signals derived from corresponding stages of said counters and having their outputs connected to the stage of the respective pair to be maintained in phase synchronism with the other stage of said pair. There is maintained as a result thereof an automatic synchronism between the instantaneous states of the counters after a relatively small number of counting operations following an initial out-of-step condition of the counters. In order to synchronize counters located at widely remote stations, such as a pair of counters serving as basic scrambling and unscrambling pulse generators at the transmitter and receiver of secrecy pulse signal transmission system, the instantaneous states of the transmitting counter are reproduced at the receiver by means of a shift register having an equal number of stages to the stages of said counter and being excited by a time-division control pulse series produced by scanning the stages of the transmitting counter at a frequency at least equal to the clock frequency times the number of counter stages, said control pulse series being transmitted from the transmitting to the receiving station through a suitable synchronizing signal channel. In this case, synchronization is effected between the receiving counter and said register replacing the transmitting counter. By the use of an adequate number of counter stages, repetitive patterns in the final scrambling pulse signal, facilitating deciphering by unauthorized persons, may be increased beyond the average message duration.

3,651,262
LASER SYSTEM FOR MAGNETIC RECORDING AND PLAYBACK

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 1, 1970, Ser. No. 42,114
Int. Cl. G11b 7/00, 11/10
U.S. Cl. 178—6.6 A **2 Claims**

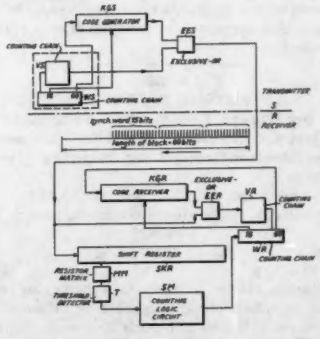


Video recording in a transverse format on magnetic tape is achieved by scanning a laser beam across a series of spaced photoconductive strips closely adjacent the magnetic tape recording medium. Playback is accomplished by projecting a plane-polarized laser beam on the magnetized tape for rotation of the polarization plane by magnetic fields present, and directing the reflected beam through an analyzer set to block polarization components in the original polarization plane but passing components whose polarization planes are rotated by the reading process. A photodetector or photomultiplier translates the light passed by the analyzer to a conventional video signal. An alternate embodiment provides for optically direct recordation and retrieval of two dimensional images.

3,651,263
METHOD FOR SYNCHRONIZING DIGITAL SIGNALS AND AN ARRANGEMENT FOR CARRYING OUT THE METHOD

Ulf Robert Oscarson Lindback, Tyreso, and Herman Josef Burghardt Vollmer, Vendelso, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 13, 1970, Ser. No. 19,310
Claims priority, application Sweden, Mar. 26, 1969, 4248/69
Int. Cl. H04j 3/06; H04l 7/08
U.S. Cl. 178—69.5 R **8 Claims**



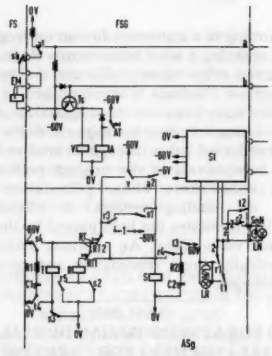
The invention relates to a method and an arrangement for synchronizing blocks of digital signals transferring information from a transmitter to a receiver. A cyclically repeated counting process the greatest value of which corresponds to the number of bits in the block controls a parallel-series con-

version on the transmitter side and a series-parallel conversion on the receiver side. A cyclically generated synchronizing word formed of ones and zeros is logically superposed on the digital signal on the transmitter side and on the receiver side the same synchronizing word is again logically superposed on the combined signals in order to restore the original digital signal. During intervals occurring necessarily in continuous speech the synchronizing word appears alone and is identified and the number of its occurrence is counted. After a definite number occurrences of the synchronizing word a control pulse is generated which starts the cyclically repeated counting process on the receiver side.

3,651,264
APPARATUS FOR CALL SIGNALLING IN TELETYPEWRITER SUBSCRIBER STATIONS

Ronald Zott, and Klaus Schliefer, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 27, 1969, Ser. No. 870,183
Claims priority, application Germany, June 28, 1968, P 17 62 504.6
Int. Cl. H04l *11/00*
U.S. Cl. 178—69.6 **12 Claims**



A circuit arrangement for call signalling in teletypewriter subscriber stations, each having long distance switching apparatus with switching devices and associated contacts to establish connections between teletypewriter subscriber stations, and a voltage supply source.

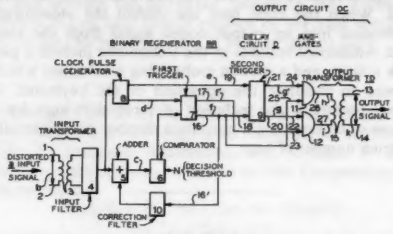
At least one of optical and acoustical call signalling indicator devices having associated switching means controllable over said associated contacts are located at each teletypewriter subscriber station. The voltage supply of the long distance switching apparatus is connectable to operate the indicator devices.

3,651,265
BIPOLAR REPEATER

Derk Van Der Houwen, Leidschendam, Netherlands, assignor to De Staat der Nederlander, Ten Deze Vertegenwoordiga Door de Directeur-Generaal der Posterijen, The Hague, Netherlands

Filed Apr. 30, 1970, Ser. No. 33,182
Claims priority, application Netherlands, June 5, 1969, 6906935
Int. Cl. H04l *25/52*
U.S. Cl. 178—70 R **18 Claims**

The invention relates to a bipolar repeater to be used in any system in which the transmission of information takes place by means of pulses in bipolar or pseudo-ternary form. The sensitivity of such a repeater to disturbances in limited to a value characteristic of a binary repeater. An input filter converts the distorted bipolar signal received from the transmission path into a binary signal. A binary regenerator provided with feedback and having two output terminals makes good the low-frequency shortage of this signal. An output circuit restores the signal to the bipolar form. This circuit has two AND-gates, one of which combines the first regenerator output, delayed by one bit in a delay circuit, with the second,

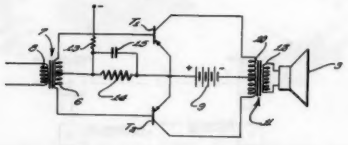


the other combining bit in second regenerator output, delayed by one bitin the delay circuit, with the first. The output terminals of the two gates are connected to the primary side of the output transformer.

3,651,266
AMPLIFYING SYSTEM WITH REDUCED FEEDBACK

Daniel L. Queen, Chicago, Ill., assignor to Chamberlain Manufacturing Corporation, Chicago, Ill.

Filed Aug. 11, 1969, Ser. No. 849,016
Int. Cl. H03f *21/00*
U.S. Cl. 179—1 FS **10 Claims**

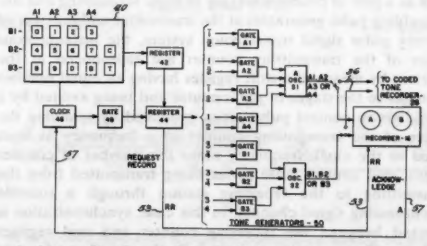


An amplifying system, particularly for application in which the input and output transducers are closely coupled acoustically, for example, hand-held power megaphones and the like, as a result of which feedback howl may occur, in which an amplifier stage thereof is constructed for class B operation and is provided with a capacitor in the input circuit thereof, arranged to be charged by an input signal and apply a reverse bias to said input circuit operative, in the presence of a sustained feedback howl, to effect a reduction in the gain of such stage and the amplifier sufficient to cut off such howl.

3,651,267
DATA COLLECTING AND TRANSMITTING SYSTEM AND APPARATUS

Wallace Wayne Wittenberger, Evanston, Ill., assignor to Computer Management Consultants, Inc., Skokie, Ill.

Filed May 12, 1969, Ser. No. 823,586
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP **6 Claims**



A data collecting and transmitting system and apparatus collecting digital data and converting the data to a series of coded tones for transmission to a central data terminal, and means for recording the coded tones for subsequent reconversion to the original digital data. In one specific embodi-

ment the original digital data is converted into coded tones compatible with transmission over a voice grade telephone line interconnecting the central data terminal and one or more data collecting stations, and means are provided for the immediate recording of the coded tones either at the data station and/or at the central data terminal. Apparatus providing a coded ring-in timing sequence, station "status tones," and a selective playback operation are included in the overall system interconnecting the central data terminal with a plurality of collecting data stations.

3,651,268

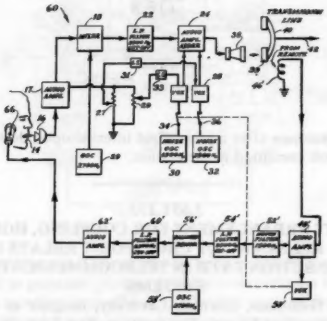
COMMUNICATION PRIVACY SYSTEM

Bernard W. Rivkin, East Meadow, N.Y., assignor to Scrambler and Seismic Sciences, Inc., Hempstead, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,795

Int. Cl. H04m *1/70*

U.S. Cl. 179—1.5 M **16 Claims**



A communication system which employs masking signals to encode the transmitted signal and means to strip the masking signals at the receiving end. Provision is made for simple, replaceable, plug-in modules which determine the frequency of the masking signals. Provision is made for switching between a multiplicity of masking signals on a random basis. Further, the masking signals are present in the carrier only during transmission of intelligence making detection of the frequencies employed difficult.

3,651,269

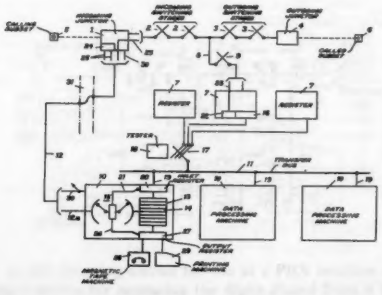
ACCOUNTING SYSTEM FOR TELEPHONE EXCHANGES

Guy Jean Le Strat, Meudon, and Michel Bradane, Lannion, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,044

Int. Cl. H04m *15/00*

U.S. Cl. 179—7 R **4 Claims**



Data on telephonic toll communications are recorded in an automatic toll exchange by means of computers and magnetic tape machines instead of by ticketing in the several originating exchanges. Incoming toll junctors in a group are scanned from a computer associated with the groups. A definite cell in the computer's store is allotted to each of the associated junctors to simplify operation and shorten recurrent cycles. Initial data on an incoming call is transferred from the register which serves the call to the computer. When the release of a junctor is stated, final data in its allotted cell is transferred to the recording machine. The charges can be computed in a later handling of the records, in an accounting office.

3,651,270

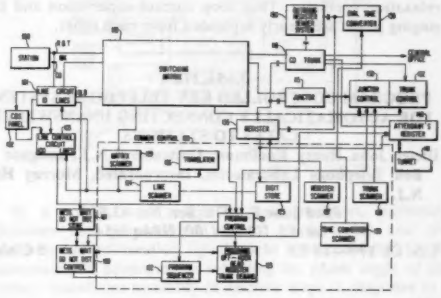
MESSAGE WAITING AND DO-NOT-DISTURB ARRANGEMENT

Ernest O. Lee, Jr.; John A. Adams, Jr., and Ignas Budrys, all of Fairport, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 26, 1970, Ser. No. 84,082

Int. Cl. H04m *3/42*

U.S. Cl. 179—18 B **23 Claims**



A PBX telephone system, particularly adapted for hotel and motel use, includes a message-waiting and a do-not-disturb arrangement. A lamp is mounted at the telephone in each hotel room, and is controlled by logic and storage circuitry which receives signals from the attendant's register and turret. To place a line in a particular mode, either do-not-disturb or message-waiting the attendant merely depresses a respective key on her turret and dials the line number. The lamp will flash on and off for a message-waiting indication and steadily for a do-not-disturb indication. During either mode the telephone may be used to place outgoing calls.

3,651,271

CIRCUIT ARRANGEMENT INCLUDING A RELAXATION OSCILLATOR FOR ALTERNATELY PROVIDING RINGING-TONE AND SUPERVISORY SIGNALS TO SUBSCRIBER STATIONS

Hans-Ulrich Knauer, Ludwigsburg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 9, 1970, Ser. No. 26,940

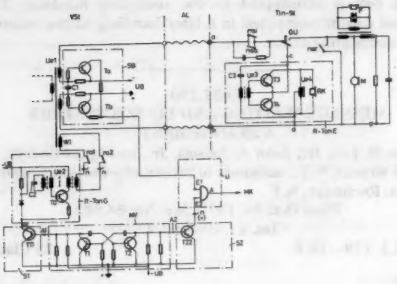
Claims priority, application Germany, Apr. 17, 1969, P 19 19 585.8

Int. Cl. H04m *1/26;* **H04q** *9/00*

U.S. Cl. 179—18 HB **9 Claims**

A loop current supervisory device and a central tone

generator are coupled to a line leading to a called subscriber. Each is alternately rendered operative via a central astable



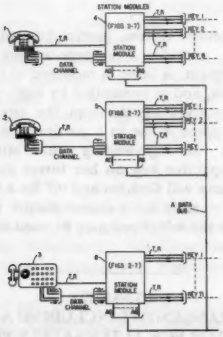
relaxation oscillator. Thus loop current supervision and the ringing phase are clearly separated from each other.

3,651,272

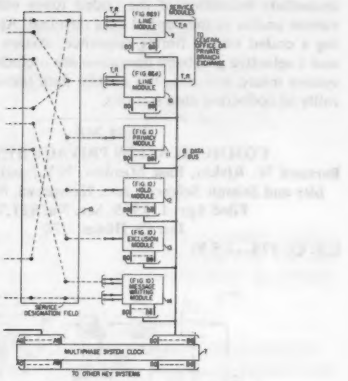
PROGRAM CONTROLLED KEY TELEPHONE SYSTEM FOR AUTOMATICALLY CONNECTING UNANSWERED CALLS TO STATIONS

Dieter John Henry Knollman, Guttenberg, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 5, 1970, Ser. No. 43,813
Int. Cl. H04m *1/00*; H04q *3/54*
U.S. Cl. 179—18 ES **8 Claims**



A program controlled key telephone system which includes line modules and station modules for providing the interface circuitry between PBX/CO lines and stations is disclosed. System operations are controlled by a multi-phase clock which generates a reiterative list of binary coded signals based on a master program. The system is arranged for controlling the connection of calling lines to a first one of a group of stations after a prescribed interval upon detection of an off-hook condition at the station.

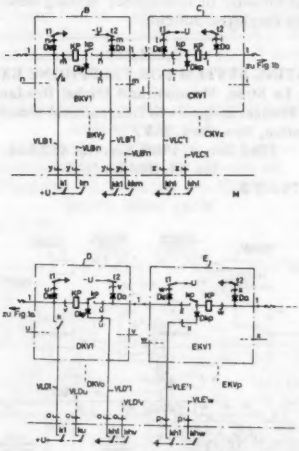


3,651,273

CIRCUIT ARRANGEMENT FOR COUPLING, HOLDING AND RELEASING OF CROSSPOINT RELAYS IN A CONNECTION PATH IN TELECOMMUNICATION SYSTEMS

Heinrich Halfmann, Korntal, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,833
Claims priority, application Germany, Oct. 16, 1968, P 18 03 220.7
Int. Cl. H04q *3/495*
U.S. Cl. 179—18 GE **9 Claims**



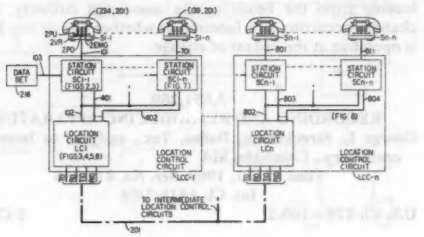
A marking and holding circuit for cross-point relays in a plural stage communications switching network. In each

stage, the winding of the cross-point relay is held through an individual hold path including its own contacts. The holding potential in successive stages is connected in a back-to-back arrangement to allow selected relays in successive stages to be seized in multiple to complete a path through the network. In the path, the selected relay in each stage is held individually through its own cross-point contacts.

3,651,274
SELECTIVE SIGNALING SYSTEM

Ronald Joseph Angner, Freehold, and Anthony Koscinski, Brick Town, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1970, Ser. No. 78,053
Int. Cl. H04m *3/16*
U.S. Cl. 179—19 **24 Claims**

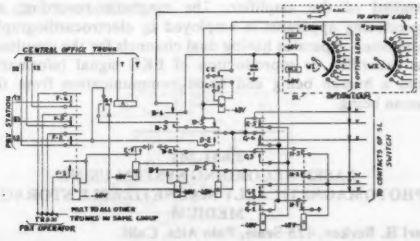


A multilocation private line selective signaling system is arranged to generate privacy lockout tones when a first station at any location goes off-hook. The first such off-hook station is designated a controlling station and circuitry at each location responds to the lockout tones by removing signaling and communicating capability from all but the controlling station. Communication capability is extended only to those stations signaled by the controlling station and busy tone is returned to any off-hook station which has not been given such capability. Each location is arranged with circuitry for controlling data transmission between stations and for preventing any station from interfering with the data.

3,651,275
TOLL DIVERTING CIRCUIT

J. Ernest Regniere, St. Foy, Quebec, Canada, assignor to The Bell Telephone Company of Canada, Montreal, Quebec, Canada

Filed Nov. 24, 1969, Ser. No. 879,395
Int. Cl. H04m *3/60*
U.S. Cl. 179—27 CB **3 Claims**

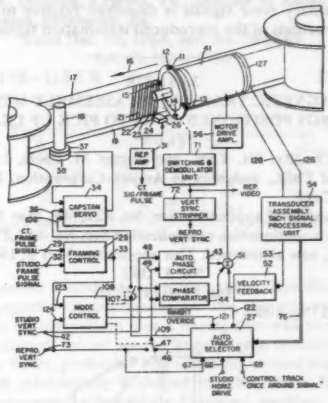


A toll diverting circuit for use at a PBX location comprising a device for repeating the digits dialed from a PBX station towards a Central Office and a second device responsive to said digit repeating device for registering and analyzing at least the first three non-repetitive digits dialed to the Central Office. The analyzing device comprises first switching means for diverting a call to a PBX operator when the digits dialed are unauthorized, second switching means for opening the pulse repeating path and the diverting path when the digits dialed are authorized, and a third switching device for absorbing a first digit dialed and for diverting the call to the PBX operator when a subsequent non-authorized digit is dialed.

3,651,276
AUTOMATIC PHASING OF SERVO SYSTEMS

Harold V. Clark, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1970, Ser. No. 25,052
Int. Cl. G11b *5/52*
U.S. Cl. 179—100.2 T **6 Claims**



In a rotary scan magnetic tape transport, mistiming between the prerecorded control track signal and the prerecorded information signal tracks is compensated for by automatically advancing or retarding the phase angle of the rotary transducer assembly in discrete steps in response to a measured magnitude and direction of the timing error. During preliminary servo modes of the tape transport system in preparation for reproducing a prerecorded information signal, the tape is initially driven by a capstan servo so that synchronizing pulses carried by the tape control track assume a preselected phase relationship with a reference signal. The rotary transducer assembly is driven to phase synchronize with the same reference signal and is thereafter selectively advanced or retarded in phase in accordance with a detected timing error between the control track and the reproduced information signal. Thereupon, the capstan servo is coupled to synchronize the control track and thus the longitudinal tape position with the rotation of the transducer assembly while the assembly is rotatably driven to synchronize the reproduce information signal with the reference signal.

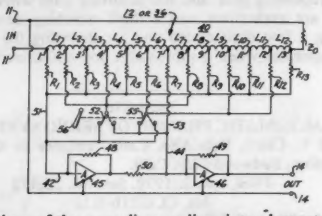
3,651,277
INFORMATION RECORDING AND REPRODUCTION APPARATUS WITH SIGNAL DISPERSION AND RESTORATION FILTERS

Wayne Kassell Hodder, Glendora, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 643,119, June 2, 1967, now Patent No. 3,530,256, dated Sept. 22, 1970. This application Feb. 10, 1970, Ser. No. 10,167. The portion of the term of this patent subsequent to Sept 22, 1987, has been disclaimed.
Int. Cl. G11b *5/02*
U.S. Cl. 179—100.2 K **7 Claims**

Apparatus for recording and reproducing time-varying electric information signals having means for recording infor-

mation corresponding to elemental fractions of the electric information signals on extended sections of a recording medium, and means for converting information recorded on ex-



tended sections of the recording medium into elemental fractions of reproduced information signals, whereby the energy of momentary error signals is dispersed relative to the elemental fractions of the reproduced information signals.

3,651,278

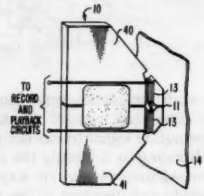
MAGNETIC TRANSDUCER ASSEMBLY WITH WINDINGS POSITIONED SO AS TO PICK UP LEAKAGE FLUX

Joseph Chupity, Mt. View, and Burnet M. Poole, Los Altos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of application Ser. No. 822,745, May 7, 1969, which is a continuation of application Ser. No. 462,272, June 8, 1965, now abandoned. This application May 6, 1970, Ser. No. 37,362

Int. Cl. G11b *5/20*

U.S. Cl. 179—100.2 C **9 Claims**



A magnetic transducer defining a substantially closed magnetic circuit including a pair of core halves separated by a front non-magnetic gap and defining an internal aperture having a diverging side wall portion extending from the rear of the front gap. A head winding is disposed about the core half and through the aperture and encompasses the core half so that there is no magnetic shunt across the winding. The turns of the winding closer to the front gap are disposed adjacent the front gap on the diverging side wall portion and in the path of the principal concentration of flux at the back of the front gap so as to significantly reduce the amount of flux which does not link the winding.

3,651,279

COMMUTATOR CONTROLLED MAGNETIC RECORDING AND REPRODUCING SYSTEM

Hisao Kinjo, Yokohama, and Toshi Suzuki, Kamakura, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of application Ser. No. 550,398, May 16, 1966, now Patent No. 3,445,608, dated May 20, 1969. This application Jan. 13, 1969, Ser. No. 790,583

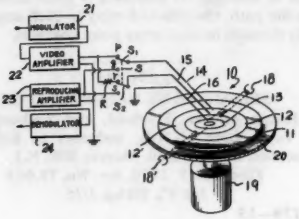
Claims priority, application Japan, May 21, 1965, 40/29915.

The portion of the term of this patent subsequent to May 20, 1986, has been disclaimed.

Int. Cl. G11b *15/14*

U.S. Cl. 179—100.2 T **6 Claims**

A magnetic tape recorder for television video signals uses two sequentially active magnetic heads mounted on a revolving disk. A commutator is arranged to rotate in synchronism with the revolving disk and to act as a program switch for selecting the magnetic head switching points and for controlling the associated circuitry. The program selectively



changes the instantaneous electrical characteristics of a path leading from the heads to the associated circuitry, these changes occurring as a function of whether one or two heads is operative at the instant of change.

3,651,280

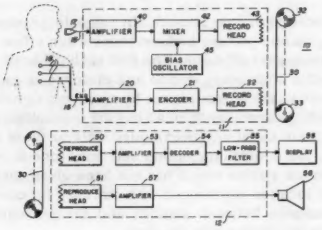
RECORDING AND REPRODUCING APPARATUS

George L. Streckmann, Dallas, Tex., assignor to Intermedcraft Corp., Columbia, Md.

Filed Apr. 1, 1969, Ser. No. 811,856

Int. Cl. A61b *5/04*

U.S. Cl. 179—100.2 **5 Claims**



Disclosed are novel encoder and decoder networks for respective incorporation into magnetic medium recording and reproducing apparatus. The encoder includes a pulse generating operational amplifier with positive and negative feedback, the input signal and a capacitor coupled to the inverting input of the operational amplifier. The decoder includes a pulse generating operational amplifier, the input signal respectively coupled to the non-inverting and inverting terminals of the operational amplifier through a resistor and paralleled combination of diodes connected in opposite polarity, a capacitor coupled to ground from the inverting terminal of the amplifier. The magnetic recording and reproducing apparatus is employed in electrocardiographic monitoring apparatus having dual channels for the simultaneous recording or reproduction of EKG signal information from a human being and voice communication from that human being.

3,651,281

LASER RECORDING SYSTEM USING PHOTOMAGNETICALLY MAGNETIZABLE STORAGE MEDIUM

Carl H. Becker, 425 Seale, Palo Alto, Calif.

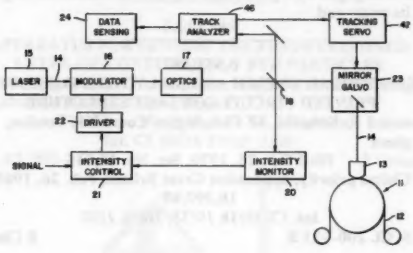
Filed June 6, 1969, Ser. No. 830,965

Int. Cl. G11b *7/24*

U.S. Cl. 179—100.2CH **30 Claims**

An optical coherent light data recording and reading system utilizing an erasable and/or permanent recording medium. The recording medium is formed of a layer of sub-

stantially transparent photomagnetically responsive magnetizable material having a anisotropic optical response under magnetization coated on a substrate or carrier. The substrate may have a reflective surface or a thin reflective metal layer may be interposed between the substrate and the layer of magnetizable material. A polarized beam of coherent light generated by a laser in a wavelength suitable for optical pumping of exchange resonance spinwave modes of the magnetizable material is focused by an optical recording head onto the photomagnetically responsive layer of magnetizable material in a diffraction limited spot size. Optical pumping is achieved by either parametric excitation or quantum-mechanical excitation. The laser beam and recording medium are translated relative to each other and the rate of translation and laser intensity are adjusted so that the thermal



temperature developed in the layer of magnetizable material is less than the Curie temperature of the material during recording. The recording laser beam is optically modulated to induce localized photomagnetization along the recording medium to thereby provide remanent tracks of variable birefringence in the magnetizable material as a function of a signal to be recorded. Readout is accomplished with a reading laser by means of the Faraday effect. Preferably optical recording takes place in the spectral region of maximum absorption efficiency by the exchange resonance modes of the recording material while optical readout takes place in the spectral region of maximum Faraday rotation. Ramanent data tracks are erased by secondary scanning of the recording laser at an intensity and/or scanning rate sufficient to heat the record material above the Curie temperature.

3,651,282

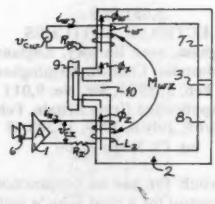
DISTORTIONLESS MAGNETIC COMPONENTS

Martin E. Gerry, 13452 Winthrope Street, Santa Ana, Calif.

Continuation-in-part of application Ser. No. 599,335, Oct. 31, 1966, now Patent No. 3,504,229. This application June 19, 1969, Ser. No. 840,121

Int. Cl. G11b *5/12*

U.S. Cl. 179—100.2 C **9 Claims**



The principles and use of magnetic main core flux and ways for eliminating mutual flux components contributing to distortion in a group of magnetic devices results in these magnetic devices having better operating characteristics and hence results in better and higher fidelity products. Included are components such as record and reproduce heads. A basic core structure provides distortion-free properties in magnetic heads, and its use in computer applications contributes to faster computation time. The freedom from distortion enhances pulse handling ability, reduces the quantity of wave shape restoration components needed in equipment wherever used, and enables a greater amount of information to be stored in a smaller amount of space on a recording medium in view of the freedom from distortion components, which actually use up a large portion of frequency spectrum and hence recording space.

3,651,283

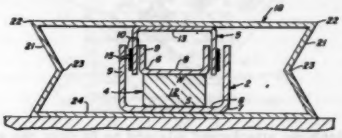
LOUDSPEAKER HAVING ELONGATED RECTANGULAR MOVING COIL

Antony Z. Doschek, Crafton, Pa., assignor to Audio Arts Incorporated, Pittsburgh, Pa.

Filed Dec. 18, 1968, Ser. No. 784,669

Int. Cl. H04r *9/06*

U.S. Cl. 179—115.5 R **53 Claims**



An acoustic transducer of planar shape. Specifically, the electromagnetic driving means for the acoustic transducer may have (i) magnetized means having thin-wall portions for forming pairs of spaced apart elongated gaps containing fixed magnetic fields, preferably by positioning second magnetized elongated substantially U-shaped member about first magnetized elongated substantially U-shaped member, and (ii) driver means consisting of a non-magnetizable conductor forming means for positioning electric conductor means in said gaps. The non-magnetizable, preferably rigid diaphragm for the acoustic transducer is operably attached to the electromagnetic driving means and may be supported by flexible means. The diaphragm may be a self-supporting tubular diaphragm, having a driver part and flexible support parts, which houses the electromagnetic driving means.

3,651,284

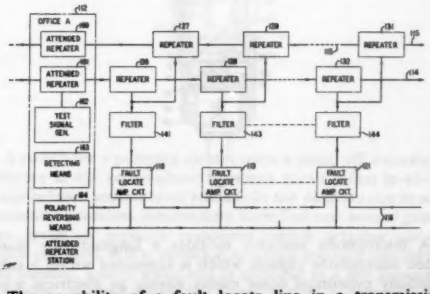
EXTENDING THE CAPABILITY OF A FAULT LOCATE LINE

Theodore Lincoln Malone, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Nov. 10, 1970, Ser. No. 88,297

Int. Cl. H04b *1/60*

U.S. Cl. 179—175.31R **5 Claims**



The capability of a fault locate line in a transmission system is extended through selective powering of fault locate

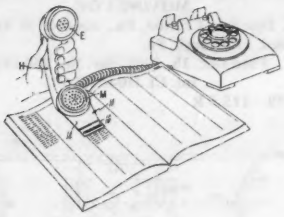
amplifiers by polarity reversal of the line power. A standard test procedure can be duplicated to evaluate the operation of unattended repeater stations associated with fault locate amplifiers in each section of the fault locate line as a separate group by simply reversing the powering polarity.

3,651,285

TELEPHONE HANDSET ATTACHMENT FOR FACILITATING DIRECTORY READING

Theodore J. Tomaiuolo, 16 Standish St., Hartford, Conn.

Filed Mar. 9, 1970, Ser. No. 17,455
Int. Cl. H04m *1/21*
U.S. Cl. 179—178 **8 Claims**



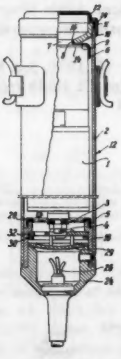
A telephone attachment adapted to fit over the ear piece or mouthpiece of a telephone handset as an aid to locating a telephone listing. The attachment is in the form of a tab having a rectangular aperture at one end that can be flattened against the telephone directory by manipulating the handset. The aperture is commensurate in size with a telephone listing so that a listing, once located in the aperture, is highlighted for the telephone user while the telephone number is dialed.

3,651,286

LAVALIER MICROPHONE ASSEMBLY PROTECTED AGAINST FRICTION NOISES

Rudolf Gorike, and Karl Lemoch, both of Wien, Austria, assignors to AKG Akustische U. Kino-Gerate Gesellschaft mbH, Wien, Austria

Filed Jan. 12, 1970, Ser. No. 2,596
Claims priority, application Austria, Jan. 13, 1969, A 300/69
Int. Cl. H04r *1/28*
U.S. Cl. 179—180 **9 Claims**



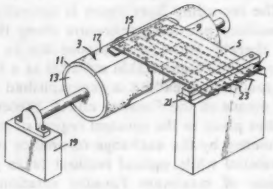
A microphone assembly includes a longitudinally elongated microphone capsule which is supported within a substantially cylindrical outer casing having an electrical wire connection entering the casing from one end. The microphone is provided with an acoustic inlet at the opposite end of the casing and it is supported in the casing at least at each end by a vibration absorbing support. The support isolates the microphone capsule from noise transmitted to the outer casing. The support at the acoustic inlet end of the microphone capsule comprises a resilient vibration absorbing annular molding which has an inward and radially extending inner end which bears against a collar of a cap which is fitted over the acoustic ends of the microphone. The outer periphery of the annular molding engages against the inner wall of the casing and is held in place by friction or by an adhesive. The cap includes an annular surface which is arranged over the end of the microphone capsule and it includes a collar forming a "Helmholtz resonator" together with an air chamber defined between the protective cap and the diaphragm of the microphone capsule. The molding holding the cap in position forms a funnel which opens outwardly and is engaged by a perforated cap and its associated ring nut at its outer end.

3,651,287

ELECTRICAL SWITCH ASSEMBLY WITH IMPROVED PRINTED CIRCUIT CONTACT STRUCTURE

Leonard Rubenstein, 27 Chessington Court N3, London, England

Filed Feb. 26, 1970, Ser. No. 14,615
Claims priority, application Great Britain, Feb. 26, 1969, 10,397/69
Int. Cl. H01h *19/58;* **H05k** *1/00*
U.S. Cl. 200—11 R **8 Claims**



An electrical switch wherein one or more contacts are provided on a first contact member which is resilient and is formed of a layer of electrically conductive material on a base layer of insulating material. This contact member is biassed into engagement with a second contact member when the switch is closed. The second contact member is preferably a similar resilient member which may be secured to one face of a supporting member. Resilient sheets from which a plurality of different contact members can be cropped are also disclosed.

3,651,288

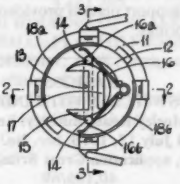
ELECTRICAL SWITCHES

Edward Cryer, Higham, near Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 5, 1970, Ser. No. 9,011
Claims priority, application Great Britain, Feb. 18, 1969, 8,612/69; July 8, 1969, 34,388/69
Int. Cl. H01h *21/00*
U.S. Cl. 200—44 **8 Claims**

An electrical switch for use in conjunction with a key operated ignition control for a road vehicle includes a hollow body carrying a pair of fixed contacts. A movable bridging contact is movable by an insulating operating member into engagement with the fixed contacts to bridge the fixed contacts when the operating key is inserted into the ignition con-

trol. The switch is used in conjunction with an alarm device and a switch operated by the driver's door of the vehicle, so



that the alarm device is operated when the driver's door is opened with the key left in the ignition control.

3,651,289

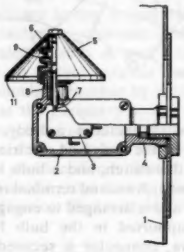
APPARATUS FOR SENSING THE PREDETERMINED LEVEL OF CONTINUOUSLY FED PARTICLES

Hiroshi Nagashima, Osaka, Japan, assignor to Noken Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1969, Ser. No. 886,497

Int. Cl. H01h *35/00, 3/00*

U.S. Cl. 200—61.2 **2 Claims**



The apparatus according to this invention is adapted to be fixed within a receptacle into which particles are continuously fed. When the level of the particles reach the apparatus and the particles cover a cone provided with said apparatus, said cone descends and closes the switch of the electrical circuit containing a signalling apparatus and, if desired, apparatus for suspending the feed and discharging the contents of the receptacle. Several forms of the cones are also shown.

3,651,290

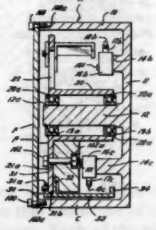
GRAVITY SWITCH ASSEMBLY

Larry E. Durbin, and Robert Thomas, both of Houston, Tex., assignors to Big Three Industrial Gas & Equipment Co.

Filed June 1, 1970, Ser. No. 42,242

Int. Cl. H01h *35/02*

U.S. Cl. 200—61.45 **12 Claims**



A gravity actuated control apparatus useful in controlling the operation of pipe welding equipment or other equipment used on pipes, beams, or other members, which control apparatus is actuated by gravity to generate triggering or control operations at preselected points along the periphery of the pipe or other member. The assembly uses switches, or other suitable control mechanisms, which are selectively engageable in accordance with the angular position of the control apparatus with respect to the member, to initiate and terminate operations of the equipment and to properly position such equipment with respect to the member.

3,651,291

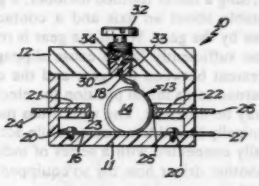
ROLLER-BAND DEVICE WITH OVER-CENTER MEANS

Gary Raymond Bluem, Golden Valley, Minn., assignor to Kroy Industries, Inc., Minneapolis, Minn.

Filed Feb. 9, 1970, Ser. No. 9,606

Int. Cl. H01h *13/48*

U.S. Cl. 200—67 DA **12 Claims**



A roller-band device including a housing, a roller and a band encircling the roller and having its ends attached to the housing in tension. A portion of the band acts as a leaf spring to provide over-center action of the roller between two end positions. Means is provided for adjusting the spring force of the over-center means and thus the force required to move the roller between the two end positions.

3,651,292

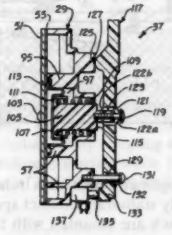
PRESSURE RESPONSIVE SWITCH WITH ACTUATOR PIVOTAL ABOUT DIFFERENT AXES FOR LOW AND HIGH PRESSURE ACTUATION

Ezra D. Hartley, 2700 Jalmia Drive, Los Angeles, Calif.

Filed July 2, 1970, Ser. No. 51,930

Int. Cl. H01h *35/24, 35/34*

U.S. Cl. 200—81 R **8 Claims**



A switch for a pumping system turns a pump off whenever pressure in the accumulator increases above a first level or drops below a second level and allows the pump to run at accumulator pressures intermediate such first and second pressure levels. A pressure responsive switch actuator pivots about one pivot axis in response to a high pressure condition and another, spaced pivot axis in response to a low pressure condition. In both cases the same switch is actuated. A manual override is also provided.

3,651,293
ELECTRIC TEETER TOTTER SWITCH

Benedict J. Hoffman, 2230 Chestnut Street, Fort Wayne, Ind.

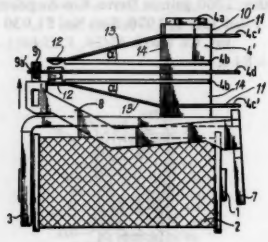
Filed Oct. 22, 1970, Ser. No. 82,976
Int. Cl. H01h 3/40, 3/14
U.S. Cl. 200—153 P 8 Claims

A mechanically actuated multicontact electrical switch having an electrical status dependent upon its history is disclosed comprising a linear toothed member, a gear supported on and rotatable about an axis and a contact device frictionally driven by the gear. When the gear is rotated from an initial position sufficiently far to cause slippage of the frictional engagement between the gear and the contact device and then returned to its initial position the electrical status of the switch may be different. The switch has particular utility when mechanically linked to an automobile accelerator pedal and electrically connected with a series of indicator lights to indicate to another driver how the so equipped automobile is being operated.

3,651,294
CONTACT ASSEMBLY WITH AN UNCHANGEABLE SWITCHING STATE AT THE INSTANT OF WELDING

Heinz Dames, and Gerhard Furtwaengler, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 26, 1970, Ser. No. 14,524
Claims priority, application Germany, Mar. 10, 1969, P 19 12 077.5
Int. Cl. H01h 1/28
U.S. Cl. 200—166 J 10 Claims

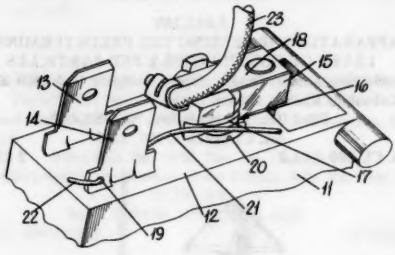


A contact arrangement such as a relay having at least a pair of substantially stationary contact springs and a movable contact spring which are mounted with the movable contact spring disposed between the pair of stationary springs characterized in that the substantially stationary contact springs have a portion extending at an angle of at least 10° to the movable contact spring so that a welding of the movable contact spring to either one of the stationary contact springs caused by arcing therebetween provides a rigid triangular structure to prevent movement of the movable contact spring into engagement with the other stationary contact spring and a short circuiting between the two stationary contact springs. Preferably the movable contact spring is moved by an actuating means having an operating member forming a connection with the movable contact spring which is either a conical slot or a ball shaped slot receiving an end of the movable contact member to guide the movable contact spring without play. To further resist movement of the substantially stationary contact springs, in a direction toward the other stationary contact spring, a support plate is provided for each of the stationary contact springs.

3,651,295
ELECTRICAL SWITCHES WITH INDICATOR MEANS

David Foley, 89 Mosley Road, Burnley, England

Filed July 15, 1970, Ser. No. 55,020
Claims priority, application Great Britain, Aug. 12, 1969, 40,186/69
Int. Cl. H01h 9/18
U.S. Cl. 200—167 A 3 Claims

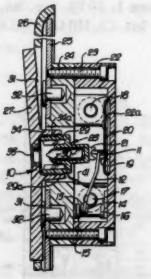


An electrical switch includes a body, a first terminal member supported by the body and electrically connected to a fixed contact of the switch, and a bulb holder detachably engaged with the body. A second terminal member is secured on the bulb holder and is arranged to engage one of the contacts of a bulb supported in the bulb holder in use. A resilient, conductive, connector is secured to the first terminal member and is arranged to engage the other contact of a bulb supported in the bulb holder in use, the connector being stressed when engaged with the other contact of the bulb so that the other contact is engaged firmly by the connector.

3,651,296
TOGGLE SWITCH HAVING ILLUMINATION MEANS

William R. Yarbrough, Cerritos, Calif., assignor to Sierra Electric, Inc., Gardena, Calif.

Filed Aug. 20, 1970, Ser. No. 65,438
Int. Cl. H01h 9/18
U.S. Cl. 200—167 A 8 Claims



An electrical toggle switch is provided with an actuator made to include an inner section having an initially open cavity containing a lamp, and a subsequently applied outer

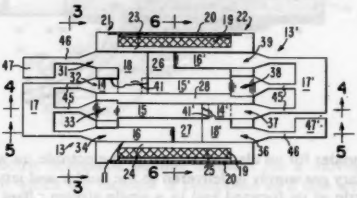
section in the form of a rocker plate which closes the cavity and is illuminated by the lamp.

3,651,297

SWITCH WITH HOUSING OF SEALED RIGID AND THERMAL PLASTIC MEMBERS

James W. Jones, Hollister, Calif., assignor to Compac Engineering Inc., Hollister, Calif.

Filed Dec. 16, 1968, Ser. No. 783,912
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 G **12 Claims**



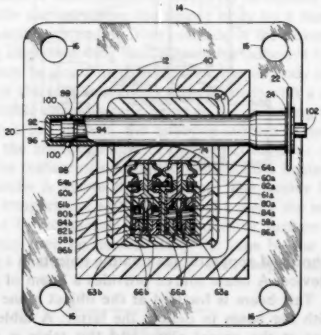
An electrical device having a rigid base member supporting electrical conductive elements and a thermal plastic member heat sealed thereto. A reed relay is described with blades mounted on a rigid ceramic base and hermetically sealed into a switching chamber by a thermal plastic cover member sealed at the periphery to the base member as by heating with a peripheral metal strip or sonic bonding. Localized deformation of the enclosure sets the gap of the contact blade. A blade is positioned in a slanted notch to spring bias the blade against another and the switching blade can be provided with a perforation filled with a precious metal contact material.

3,651,298

WEATHER AND SHOCK PROOF SWITCH CASING WITH INSERTABLE KEY SWITCH OPERATING MEMBER

Paul H. Omohundro, 1131 Barker Street, Costa Mesa, Calif.

Filed Aug. 27, 1970, Ser. No. 67,348
Int. Cl. H01h *9/04, 13/06*
U.S. Cl. 200—168 G **5 Claims**



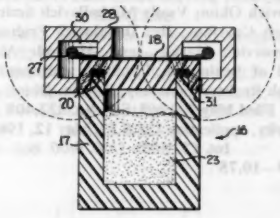
A switch structure including a pair of electrical switches that are arranged so that when one of the pair of switches is closed the other is open. Each of the pair of switches has an actuator for changing the electrical state of the switch. The actuators are displaced in unison by a bridge member that bridges across the actuators. The pair of electrical switches and the bridge member are disposed within an inner housing. The inner housing is enclosed within an outer housing that has a mounting flange co-extensive with an exterior surface thereof. An operating pin is insertable through the inner housing and the outer housing through aligned holes so that when the operating pin is inserted, the bridge member and the actuators are displaced causing a change of the electrical state of each of the pair of switches. The operating pin has a ring on an enlarged portion of one end thereof for providing ease of access.

3,651,299

METHOD FOR SEALING CONTAINERS USING HEAT ACTIVATED MAGNETIC SEALING COMPOUND

Roger M. O'Neill, Oaklawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed June 22, 1970, Ser. No. 48,004
Int. Cl. B23k *13/02*
U.S. Cl. 219—10.53 **3 Claims**



This disclosure relates to apparatus for inductively coupling energy into heat activated magnetic sealing material to effect the sealing of containers. Such apparatus includes a coil generally conforming to the shape of the container portion to be sealed and a flux concentrator or relatively high permeability and electrical resistivity for concentrating magnetic flux only in those areas of the container including the sealing material. The flux concentrator houses the coil and is formed with an air gap shaped to accommodate the container portion to be sealed. Further, this application discloses a method of sealing containers by coupling energy into heat activated magnetic sealing materials while limiting the heating of adjacent portions of the container and the container contents.

3,651,300

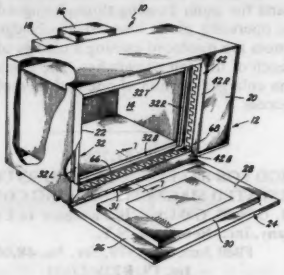
MICROWAVE HEATING APPARATUS WITH RADIATION CONTROL AND MONITORING

Duane B. Haagensen, Edina, Minn., assignor to Matsuhita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 25, 1971, Ser. No. 109,303
Int. Cl. H05b *5/00*
U.S. Cl. 219—10.55 **20 Claims**

A radiation safety device located about the entrance to a microwave oven is comprised of a wave trough-type of transmission line within which a printed circuit cross-polarized an-

tenna is disposed to permit induction of radiation of either transverse electric or transverse magnetic waves into



propagation circuits containing both dissipative and conductive elements for reducing environmental radiation leakage.

3,651,301

INSTALLATION FOR CASTING MICROWIRE IN GLASS INSULATION

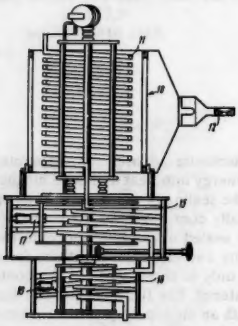
Leonid Petrovich Menchikov; Kim Ivanovich Kopylov; Evsei Lvovich Okun; Vasily Mikhailovich Smirnov; Viktor Stepanovich Gavrikov; Ilya Davidovich Fridman; Vyacheslav Evgenievich Markov, and Alexandr Alexandrovich Sopin, all of Leningrad, U.S.S.R., assignors to The National Cash Register Company, Dayton, Ohio

Filed May 7, 1969, Ser. No. 822,408

Claims priority, application U.S.S.R., May 12, 1968, 1238410

Int. Cl. H05b *5/00, 9/00*

U.S. Cl. 219—10.75 **3 Claims**



An installation for casting microwire in glass insulation with the aid of a high-frequency inductor whose oscillating system comprises at least two oscillating tank circuits with voltage stabilization; each oscillating tank circuit contains an element for regulating the equivalent or resonance impedance of the circuit and an element for stabilization of the resonant frequency or frequency of generation of the tank circuit synchronously coupled to it. The element for regulating the equivalent or resonance impedance of the circuit is designed in the form of a variable inductance coil, while the element for stabilization of the resonant frequency or frequency of generation of the tank circuit is designed either in the form of a variable capacitor or a variable inductance coil, the movable parts of the two elements being mechanically connected to one another.

3,651,302

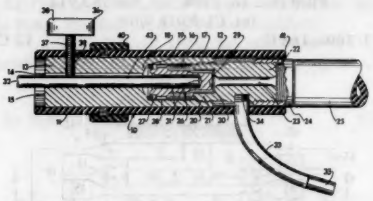
ELECTRODE HOLDER FOR GAS-ARC GOUGING TORCH

John Henry Maddison, 509 Latimer Street, Nelson, British Columbia, Canada

Filed Apr. 6, 1970, Ser. No. 25,856

Int. Cl. B23k *9/28;* **B23p** *1/08*

U.S. Cl. 219—70 **2 Claims**



A holder for an electric arc gouging electrode, in which an auxiliary gas supply is delivered to the holder and jetted from a nozzle at its forward end in a single stream offset but adjacent to and directionally parallel with the electrode. The auxiliary gas supply is normally air, and is used to eject the molten metal pool formed at the arc. The direction of offset of the gas jet is controllable by rotation of the forward portion of the nozzle. A safety valve within the holder interrupts the air supply in the event of accidental disengagement of the electrode from its clamping member, to prevent air-projection of the electrode in missile-fashion.

3,651,303

METHOD AND APPARATUS FOR TREATING OBJECTS IN A CORPUSCULAR RAY DEVICE

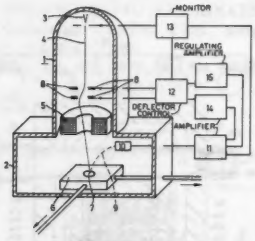
Hans Rehme, Munich, and Kurt Togel, Karlsruhe, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Oct. 20, 1969, Ser. No. 867,781

Claims priority, application Germany, Oct. 18, 1968, P 18 04 646.3

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 EB **14 Claims**



A method and apparatus for treating objects in a corpuscular ray device. A beam source provides a beam of corpuscular rays. This beam is focused at the object plane and coils coact with the beam to deflect the latter. A table supports the object at the object plane and this table is adjustable transversely with respect to the beam. The accuracy with which the table is constructed and adjusted is only sufficient to achieve a course adjustment of the object with respect to the treating beam. On the other hand, the deflecting coils deflect the beam with respect to the object which has been coarsely adjusted so as to achieve in this way a highly precise fine adjustment of the beam with respect to the object.

3,651,304

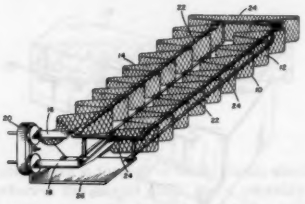
ELECTRIC RESISTANCE HEATING ELEMENT

Robert J. Fedor, Westlake, Ohio, assignor to Gould Inc., Chicago, Ill.

Continuation-in-part of application Ser. No. 96,322, Dec. 9, 1970, now abandoned. This application Mar. 31, 1971, Ser. No. 129,893

Int. Cl. H05b 1/00

U.S. Cl. 219—200 9 Claims



An electric resistance heating element for a moving air system in which the element is composed of a thin strip of apertured, foil-like material formed with a series of continuous and generally parallel extending corrugations which establish a wavy pattern. The foil is supported by a central, longitudinally extending, electrically insulated rod.

3,651,305

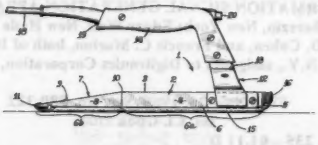
APPARATUS FOR CARPET SEAMING

Robert E. Shimota, Fox River Grove, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 8, 1969, Ser. No. 882,944

Int. Cl. H05b 1/00

U.S. Cl. 219—243 11 Claims



A thermal activator for use in the seaming of adjacent sections of carpeting. The activator comprises a heater body with a protective heat insulating means on its bottom surface and a handle carried above the heater body by a handle attachment section extending from one side of the heater body. In seaming carpeting with heat activatable adhesive tape the activator may be positioned so that the heater body is under the edges of the carpet sections to be joined, with a strip of heat activatable adhesive tape between the carpeting and the heater body's top surface, the adhesive surface of said tape contacting the abutting edges of the carpet sections and the non-adhesive surface of said tape contacting the heater body, and the handle is above the carpeting. The heater body is raised to a temperature sufficient to make tacky the adhesive on the tape by contacting the non-adhesive surface of the tape and may then be moved along the tape by the handle during the operation of seaming the carpet segments together.

3,651,306

ELECTRIC SOLDERING GUN AND TIP THEREFOR

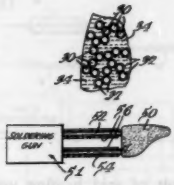
Nicholas D. Glyptis, 16 West 148 Timber View Drive, Elmhurst, Ill.

Filed Apr. 28, 1969, Ser. No. 819,922

Int. Cl. H05b 3/12; B23k 3/04

U.S. Cl. 219—233 3 Claims

A porous metal element, e.g., porous bronze, such as a mass of sintered tin-coated copper spheres, filled with a solder base material, is used as an element in a soldering device for delivering solder to the place where needed. The porous material is usually about 40–50 percent by volume, or more, interconnected voids and the voids are preferably completely filled with the solder base material to the exclusion of air. The soldering element is maintained filled with solder by surface tension while the solder is in molten condition during use of the device. The soldering element may be in the form of a tip on a soldering gun or soldering iron, or in the form of a stamping plate for stamping printed circuits or any other convenient form.



3,651,307

ROOM-TEMPERATURE REGULATOR FOR ELECTRIC HEATERS

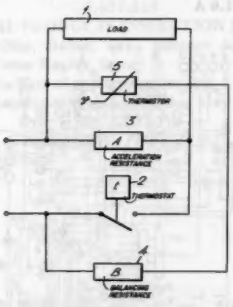
Oddvar Johansen, Trondheim, Norway, assignor to Nobo Fabrikker A/S, Trondheim, Norway

Filed Oct. 13, 1970, Ser. No. 80,319

Claims priority, application Norway, Oct. 13, 1969, 4076/69; Oct. 20, 1969, 4155/69

Int. Cl. H05b 1/02

U.S. Cl. 219—505 3 Claims



A temperature controlled regulator for electric heaters with a thermostat having an acceleration resistance and a balancing resistance, the current through the balancing resistance being controlled by a thermistor which is subjected to the temperature of the heater in such a manner that the supply of heat from the balancing resistance to the thermostat will be large with little heat requirement and little when the heat requirement is great in the room to be heated.

3,651,308

AUTOMATIC ELECTRIC COOKER

Eisuke Kurokawa; Yoshihiro Matsuo, and Hiromu Sasaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Nov. 14, 1969, Ser. No. 876,915

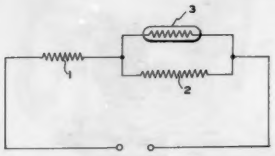
Claims priority, application Japan, June 27, 1969, 44/51995

Int. Cl. H05b 1/02

U.S. Cl. 219—505 8 Claims

An automatic electric cooker having a heating unit consisting of a metallic alloy heater having a lower resistance and a

metallic alloy heater having a higher resistance which are electrically connected in series, and a positive temperature coefficient of resistance ceramic element made of barium titanate semiconductor material electrically connected in parallel with said metallic alloy heater having a higher resistance. The circuit of said heating unit first cooks the material by heat supplied mainly from said lower resistance alloy heater, and then the resistance of said ceramic element abruptly rises to reduce the current flow so as to keep the cooked material warm by heat supplied mainly from the higher resistance alloy heater.

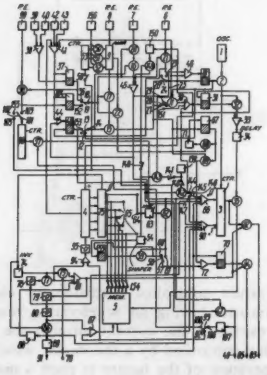


3,651,309

DEVICE FOR READING MULTICHANNEL OSCILLOGRAMS

Petr Mikhailovich Chegolin, ulitsa Kedyshko, 15-a, kv. 39; Gennady Vasilievich Rimsky, Akademicheskava, 23, kv. 15; Eduard Nikolaevich Leonovich, ulitsa Akademicheskaya, 23, kv. 12; Fridrikh Grigorievich Milner, ulitsa Opanskogo, 45, Korpus 7, kv. 108; Nikolai Nikolaevich Samuilov, ulitsa Tipografskaya, 21, kv. 13, and Nikolai Nikolaevich Anishkevich, ulitsa Cheljuskintsev, 22, kv. 3, all of Minsk, U.S.S.R.

Filed Dec. 31, 1969, Ser. No. 889,619
Int. Cl. G06k *7/10, 9/12*
U.S. Cl. 235—61.6 A **6 Claims**



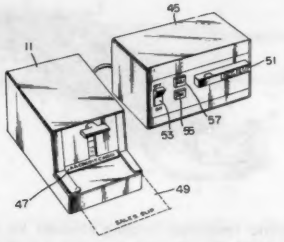
A device for reading multichannel oscillograms comprising: a circuit for the automatic adjustment of the sensitivity of an amplifier in association with a recorded line registration photoelectric cell; a circuit for producing signals indicative of the zone where a gap between oscillographic curves becomes critical; a circuit for grouping data on the ordinates of curves that have been read off a tape and for feeding said data to an electronic computer for further processing; a circuit for counting timing marks and generating signals indicative thereof, and a circuit for adjusting the pitch of the curve sampling process. The device makes it possible to provide a speed of reading graphic information commensurate with that of an electronic computer which is being supplied with this information.

3,651,310

SYSTEM FOR CREDIT CARD VALIDATOR AND IMPRINTER

John T. Link, New Haven, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 26, 1970, Ser. No. 22,957
Int. Cl. G07f *7/02;* **H01h** *43/08;* **G06k** *7/04, 17/00*
U.S. Cl. 235—61.7 B **4 Claims**



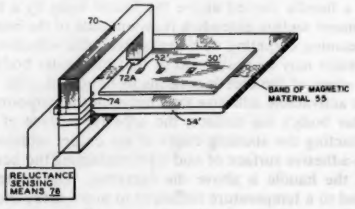
A self contained system for both imprinting the information present on a credit card and determining if that credit card has been invalidated for any of several reasons is disclosed. The system serially senses the multi-digit credit card number while the imprinting is taking place and transmits this number to a scratch pad memory. This number is then compared serially to a list of invalid credit card numbers and if a match takes place, an indicator is energized to indicate invalidity of the card.

3,651,311

INFORMATION SIGNAL GENERATION APPARATUS

Evelyn Berezin, New York; Edgar Wolf, New Hyde Park; William D. Cohen, and Francis C. Marino, both of Huntington, all of N.Y., assignors to Digitronics Corporation, Albertson, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,322
Int. Cl. G06k *7/08*
U.S. Cl. 235—61.11 D **8 Claims**



An information signal generating apparatus including a planar magnetic field shielding element which is provided with apertures representing coded information and through which a magnetic flux from a magnetic field source disposed on one side of the planar element is adapted to pass. A signal generator which may be in the form of a pair of facing pole pieces disposed on opposite sides of the planar element is adapted to move across the planar element and is provided with an inductively coupled winding. A current is induced in the winding when the pole pieces cut lines of force passing through the apertures thereby to produce electrical signals.

3,651,312
MAGNETICALLY CODED CARD STRUCTURE

Walter W. Barney, 4837 Woodley Avenue, Encino, Calif.

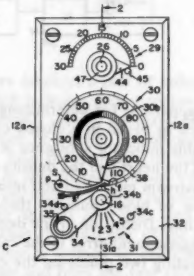
Original application June 30, 1967, Ser. No. 650,483, now Patent No. 3,430,200, dated Feb. 25, 1969. Divided and this application Feb. 10, 1969, Ser. No. 797,868
Int. Cl. G06k 19/00
U.S. Cl. 235—61.12 2 Claims

A monolithic card is formed of three plastic sheets bonded together, wherein the center sheet has a plurality of holes, each filled with a magnetic disc adapted to be axially poled. The center sheet is punched at one station, then located at a second station beneath a flexible card of magnetic material, and with its holes aligned with respective punches which simultaneously punch discs from the card and force them into holes. The center and outer sheets are stacked, and bonded under heat and pressure. The discs are magnetized with polarities at one card face distributed in a desired pattern.

3,651,313
GAME COUNTER

John D. MacKenzie, and Edwin O. Klemm, both of Saginaw, Mich., assignors to Pegless Cribbage Board Company, Saginaw, Mich.

Filed Oct. 9, 1969, Ser. No. 865,005
Int. Cl. G04b 17/14; G04c 7/00
U.S. Cl. 235—112 17 Claims

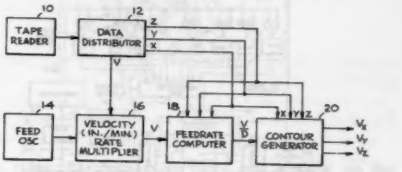


A score indicating device for the game of cribbage including a rotatable total score indicator and a rotatable partial score indicator drivingly connected therewith. Manually movable indexing apparatus is provided for simultaneously indexing the partial and total score indicators from their respective starting positions. The partial score indicator is manually returnable to its starting position and means is provided for retaining the total score indicator in an indexed position when the partial score indicator is so returned. Additional score indicators may also be provided for individually indicating the points individually accumulated in the dealer's crib and also points accumulated during the play of the individual hands.

3,651,314
FEEDRATE COMPUTER USING A READ ONLY MEMORY

Marion Kosen, Wickliffe, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 22, 1970, Ser. No. 881,397
Int. Cl. G05b 19/18; G06c 3/00
U.S. Cl. 235—151.11 8 Claims

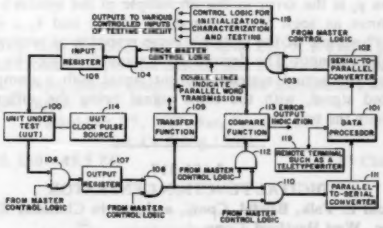


An arrangement for the numerical control of a machine tool is provided wherein, instead of a feedrate number being entered into the system, the desired velocity in inches per minute is entered. Provision is further made for a feedrate computer which computes the value of 1/D from the departure information provided for the various machine tool axes. Provision is then made to compute the feedrate number which equals V/D, which is then applied to the contour generator which controls the operation of the machine tool with its output.

3,651,315
DIGITAL PRODUCTS INSPECTION SYSTEM

Arthur A. Collins, Dallas, Tex., assignor to Collins Radio Company, Cedar Rapids, Iowa

Continuation-in-part of application Ser. No. 33,018, Apr. 29, 1970, now abandoned. This application May 14, 1970, Ser. No. 37,320
Int. Cl. G01r 31/28, 17/02
U.S. Cl. 235—151.31 31 Claims

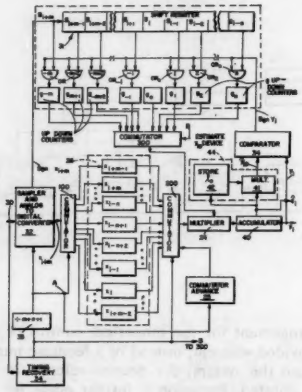


A Digital Product Inspection System using a digital pseudo-random generator in combination with a charactertistic of the product being inspected to produce a unique set of data combinations which when compared with previously taken data from the test of a "known good unit" will provide an output indicating whether or not the characteristic of the unit under test is within acceptable limits.

3,651,316
AUTOMATIC TRANSVERSAL EQUALIZER SYSTEM

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation

Filed Oct. 9, 1970, Ser. No. 79,380
Int. Cl. H04b 1/62, 3/04
U.S. Cl. 235—152 12 Claims



The invention is directed to a system for automatically adjusting the multiple gain taps in a transversal equalizer so as to minimize the errors in a received signal caused by intersymbol interference and noise. In a preferred embodiment, the sign of a delayed replica of the sampled input signal is multiplied by the sign of a derived error signal to form an incremental signal, which signal is used to increment a selected gain tap in the transversal equalizer by a fixed amount and in a direction determined by the sign of the incremental signal. This type of procedure is applied to each of the tap-gains of the transversal equalizer to drive the kth tap-gain, for example, to the value that minimizes the cross-correlation function.

$$\sum_{j=-\infty}^{\infty} \rho_j h_{j-k}$$

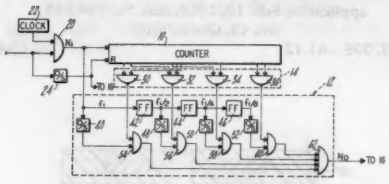
where ρ_j is the error in the jth sample of the system's pulse response as seen at the equalizer output and h_{j-k} is the $(j-k)^{th}$ sample of the system's pulse response as seen at the equalizer's input. The derived error signal is formed by comparing the actual system's output signal with a computed desired signal, with the error signal being the difference between the two.

3,651,317
DIGITAL FUNCTION GENERATOR

Ronald E. Falk, Bristol, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.

Filed June 26, 1970, Ser. No. 50,212
Int. Cl. G06f 15/34
U.S. Cl. 235—197 7 Claims

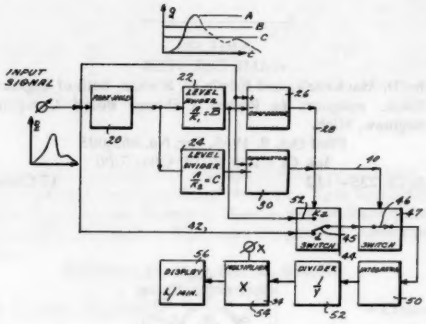
A digital function generator which may be programmed to provide an output signal which is an arbitrary function of the applied input is disclosed. An input signal is applied simultaneously to a counter and binary divider. The input counter and divider are interconnected by logic circuitry which controls the division rate in accordance with the number in the counter whereby the output of the divider will be commensurate with the number of input pulses delivered to the function generator divided by the factors decoded from the incremental position of those input pulses during each sampling period.



3,651,318
CARDIAC OUTPUT COMPUTER

Jan A. Czekajewski, 1591 Presidential Drive, Columbus, Ohio

Filed Jan. 26, 1970, Ser. No. 5,888
Int. Cl. G06g 7/18; A61b 5/02
U.S. Cl. 235—183 18 Claims



A method and apparatus for determining the rate of flow of a substance such as blood in a closed circulatory system whereby a detectable indicator substance is injected into the blood upstream of the heart and the density of that substance in the blood downstream measured and integrated in time to determine the flow of blood pumped through the heart in volume units per time. Distortion of the density waveform by recirculation and consequent error in the calculated flow rate is avoided by detecting two points on the exponential decay from the density peak and extrapolating the integral of the remainder of the wave form from these points. In contrast to prior art techniques, an analogue signal reflecting the integral of the waveform is produced and employed to obtain the flow of blood through the heart.

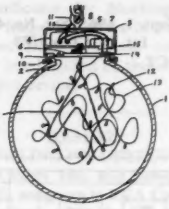
3,651,319
DISPLAY DEVICE

Raymond H. Norris, Tall Timbers, Md., and Richard H. Bradford, Jr., 3206 Edgewood Drive, Kensington, Md.

Filed Sept. 14, 1970, Ser. No. 46,179
Int. Cl. F21p 1/03
U.S. Cl. 240—10.1 6 Claims

A display device comprising an envelope of diffuse material enclosing a plurality of individually flashing lamps disposed within a cluster of opaque light barriers which may be the

conductive wires leading the the lamps. Flashing of the lamps displays irregular patterns on the envelope which vary ran-



domly in regard to point of origin, distinctness and character of pattern and color.

3,651,320

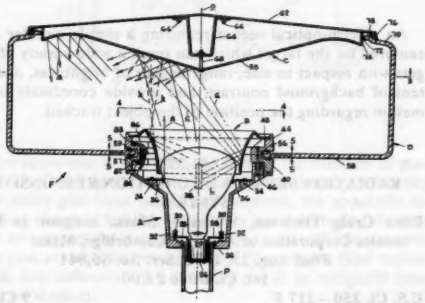
LIGHTING FIXTURES

Martin Lawrence Lasker, Metuchen, N.J., assignor to Moldcast Manufacturing Company, Newark, N.J.

Filed June 1, 1970, Ser. No. 42,385

Int. Cl. F21p *1/00*

U.S. Cl. 240—25 **9 Claims**



A lighting fixture employs a pair of reflectors related to a lamp housing which includes socket means for a lamp. One reflector is substantially tubular and extends into the housing to surround a portion of a lamp. The second reflector having a diameter larger than the diameter of the first reflector is positioned above in spaced relationship with respect to the first reflector. An enclosure of light transmitting material extends between the spaced reflectors and has a diameter which is not less than the diameter of the second reflector. The second reflector is formed to distribute light directed thereto from a lamp and from the first reflector through the enclosure.

By selecting tubular reflectors having differently angled inner reflecting surfaces, different illumination patterns are obtained without changing the outer dimensions of the tubular reflector or of the fixture.

3,651,321

SNAP-IN LENS FOR LAMP HOUSING

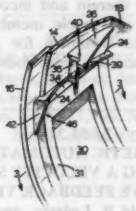
Hugo Magi, Etobicoke, and John Smith, Willowdale, Ontario, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Ontario, Canada

Filed May 6, 1970, Ser. No. 35,133

Int. Cl. F21v *17/06;* **B60q** *1/30*

U.S. Cl. 240—151 **2 Claims**

A bulb-housing having a window in a wall that is conically curved, and a transparent insert adapted to snap into the window. The internal surface of the conical wall has a ridge along either side, so positioned as to firmly grip the transparent insert. The insert has a projection which extends across one ridge and as far as a locking ridge parallel with the



said one ridge. The projection locks into a hook on the locking ridge, and the insert itself catches under a ledge on the bulb-housing which prevents the insert from removal in the direction parallel to the said ridges.

3,651,322

DEVICE FOR GAS ANALYSIS

William G. Elliott, Lincoln, Mass., assignor to SpectraMetrics, Incorporated, Burlington, Mass.

Continuation-in-part of application Ser. No. 710,992, Apr. 5, 1968, now abandoned. This application May 6, 1970, Ser. No. 35,250

Int. Cl. G01n *21/26*

U.S. Cl. 250—43.5 R **30 Claims**

A gas analysis device comprising a housing with a heated element and a gas therein as the source of radiation and a detector for the emitted radiation. Preferably, a chopper or other means are employed to permit the emission from the element and the gas to fall alternately on the detector. In an alternate embodiment, the gas in the source is of known emission characteristics and a gas to be analyzed is interposed between the source and the detector.

3,651,323

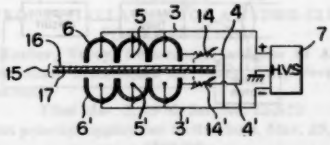
DOUBLE DISCHARGE SYSTEM AND DEVICE THEREOF

Hiroshi Tanaka; Giichi Marushima, and Shinkichi Takahashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1967, Ser. No. 678,614

Int. Cl. G03g *15/02*

U.S. Cl. 250—49.5 ZC **13 Claims**



A system for imparting charge to a chargeable member wherein corona discharge electrodes each having an associated auxiliary electrode are disposed on alternate sides of

the member. A voltage of first polarity is applied exclusively to all corona discharge electrodes on one member side and to all auxiliary electrodes on the other member side. A voltage of opposite polarity is applied to all other corona discharge electrodes and auxiliary electrodes. The system is further disclosed in preferred charging apparatus having said electrodes insulatively supported therein and incorporating a passage for transport of said chargeable member through the apparatus. Circuit means is shown for providing dissimilar potentials for the auxiliary electrodes and the corona discharge electrodes.

3,651,324

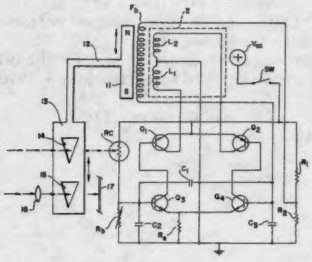
ELECTROMAGNETIC AUTOMATIC APERTURE CONTROL UTILIZING A VELOCITY SENSING WINDING TO PROVIDE ACTIVE FEEDBACK VISCOUS DAMPING

Daniel E. Carter; David B. Lederer, and David E. Perlman, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of application Ser. No. 823,426, May 9, 1969, now abandoned. This application Aug. 24, 1970, Ser. No. 66,642

Int. Cl. G01j *1/32;* **G03b** *9/02;* **H01j** *39/12*

U.S. Cl. 250—201 **8 Claims**



An automatic exposure control arrangement includes a transducer driven in respectively opposite directions by a differential amplifier which operates in accordance with changes in scene illumination. A light masking member, movable by the transducer, serves to regulate the amount of light reaching both the film and a photocell. A feedback coil is provided at the transducer for controlling the amplifier so as to provide damping.

3,651,325

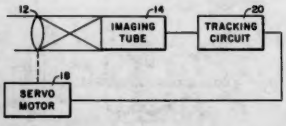
IMAGE STABILIZATION SYSTEM

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 1, 1965, Ser. No. 485,675

Int. Cl. G01s *3/78*

U.S. Cl. 250—203 **3 Claims**



A device for image stabilization in an electro-optical guided missile which utilizes a feedback loop that includes a lens, signal detecting means and a servomotor for moving the lens.

3,651,326

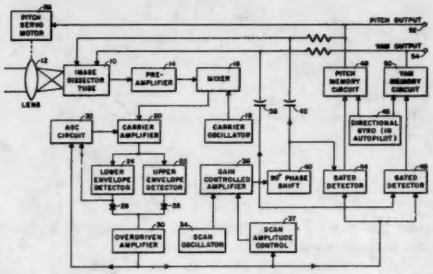
PASSIVE ELECTRO-OPTICAL SEEKER

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 1, 1965, Ser. No. 485,676

Int. Cl. G01s *3/78*

U.S. Cl. 250—203 CT **10 Claims**



An electro-optical seeker requiring a simple circular scan centered on the target which can track a wide variety of targets with respect to size, range degree of brightness, and extent of background contrast, and provide coordinate information regarding the position of the object tracked.

3,651,327

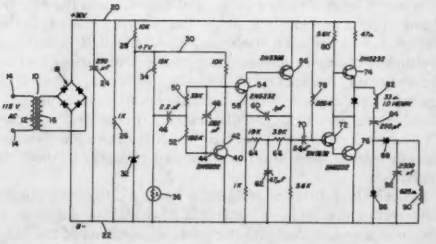
RADIATION SENSITIVE CONDITION RESPONSIVE SYSTEM

Elihu Craig Thomson, Wellesley, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Aug. 25, 1970, Ser. No. 66,841

Int. Cl. G08b *21/00*

U.S. Cl. 250—217 F **9 Claims**



A condition responsive system comprises a condition sensor for producing a fluctuating output signal having a predetermined frequency component in response to sensing of the condition to be detected, an output device arranged to assume a first state indicative of the presence of the condition being sensed when the sensor senses the condition and produces the fluctuating output signal and a second state indicative of the absence of the condition when the sensor does not produce the fluctuating output signal, and means respon-

sive to the fluctuating output signal and connected in circuit between the sensor and the output device including an inductor for blocking signals of higher frequency than the frequency of the fluctuating output signal, a capacitor connected in series with the indicator for blocking signals of lower frequency than the frequency of the fluctuating output signal and a fail safe rectification circuit connected in circuit between the series combination of the capacitor and the inductor and the output device.

3,651,328

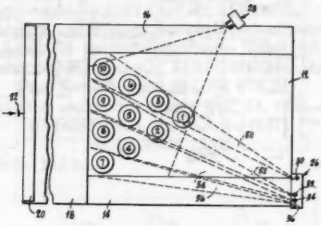
BOWLING PIN DETECTOR

Edgar Hutto, Jr., Cherry Hill, and James P. Mahoney, Mt. Holly, both of N.J., assignors to RCA Corporation

Continuation of application Ser. No. 809,663, Mar. 24, 1969, now abandoned. This application Feb. 11, 1971, Ser. No. 111,606

Int. Cl. G06m *11/00*

U.S. Cl. 250—222 R **5 Claims**



An apparatus is disclosed for noting the number of pins that are standing on a bowling alley and thereby indicating how many pins have been knocked down, the apparatus including alternate lighting of adjacent zones including the pins and an array of light sensitive means to note whether respective pins are standing or are down. To prevent false indications, any indication of a standing pin in an unlighted zone may be blocked.

3,651,329

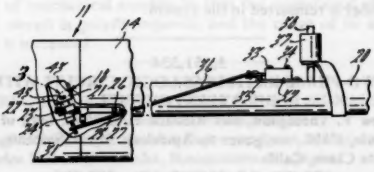
AUTOMOTIVE ANTI-THEFT SYSTEM

Philip Marlowe, 20744 Camden Square, Apt. 104, Southfield, and Joel Greenberg, 18045 Strathmoor, Detroit, both of Mich.

Filed Jan. 20, 1970, Ser. No. 4,316

Int. Cl. H02g *3/00*

U.S. Cl. 307—10 AT **9 Claims**



An anti-theft device for automotive vehicles that precludes operation of the ignition circuit if the ignition switch is tampered with. Two embodiments are disclosed that may be combined in a single system. In one embodiment, a microswitch is placed in the ignition circuit and is connected to the lock by means of a frangible element. If the lock is removed the frangible element breaks and opens the switch thus disabling the circuit. In the second embodiment, an anti-theft lock is provided that operates on the structure that interconnects the lock to the ignition switch and engages upon removal of the lock to preclude operation of the ignition switch.

3,651,330

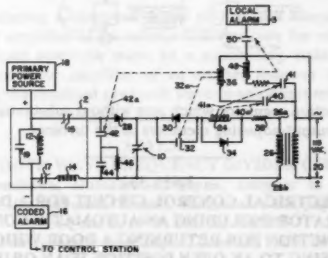
DUAL ALARM AND MASTER BOX CONTROL CIRCUIT

Frederick Vincent Hayes, Medway, Mass., assignor to Gulf & Western Systems Company, New York, N.Y.

Filed Jan. 14, 1971, Ser. No. 106,515

Int. Cl. H02g *9/00*

U.S. Cl. 307—64 **10 Claims**



The circuit uses diodes to direct half-wave alternating current signals through a signaling relay when the remote station is closed, and through the master box tripping mechanism when the remote station is open. This circuit therefore provides positive operation without using resonant circuits, and insures positive operation even when the primary power source is defective. An associated circuit tie-in between a master station tripping mechanism and its independent primary power source and a remote station actuation and its independent power source is provided whereby the circuit is operative from the primary power source when such source is normally available without effecting the secondary power source, but where the secondary power source is introduced into the circuit after a predetermined time delay if the primary power source is unavailable for any reason. The secondary power source is delayed approximately ¼ second using a time delay relay to allow the primary source time to trip the master box when the primary source is available.

3,651,331

CONTROL INSTALLATION FOR A HYDRO-ELECTRIC POWER STATION

Victor Raeber, Vevey, Switzerland, assignor to Ateliers de Constructions Mecaniques de Vevey S.A., Vevey, Vaud, Switzerland

Filed Mar. 2, 1970, Ser. No. 15,622

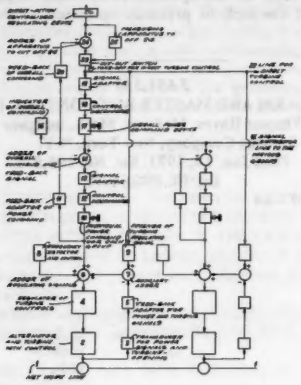
Claims priority, application Switzerland, Mar. 25, 1969, 4548/69

Int. Cl. H02j *3/46*

U.S. Cl. 307—84 **5 Claims**

A control installation for a hydro-electric power station comprises slow-action integrated means for controlling the

power outputs of each of a plurality of turbines to bring them to desired values and for equalizing the desired values, and a



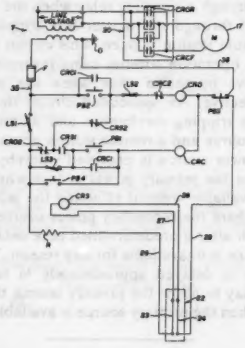
direct-action regulator which acts without substantial dephasing on output-adjusting members of the turbines.

3,651,332

ELECTRICAL CONTROL CIRCUIT FOR A DOOR OPERATOR INCLUDING AN AUTOMATIC CONTROL FUNCTION FOR RETURNING A DOOR WHICH IS CLOSING TO AN OPEN POSITION IF AN OBJECT IS ENCOUNTERED

Paul E. Cochran, Columbus, Ohio, assignor to Kinnear Corporation, Columbus, Ohio

Filed June 23, 1970, Ser. No. 48,989
Int. Cl. H02p 1/00
U.S. Cl. 307—119 **8 Claims**



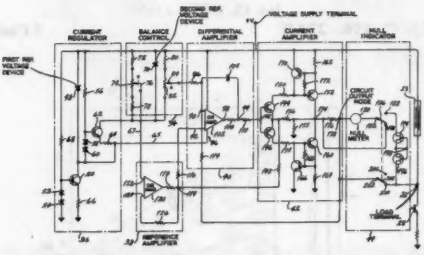
An electrical control circuit is provided for a door operator to return a door to an open position should an object be encountered by the door while moving to a closed position. The control circuit includes circuit means and a pair of normally open contacts that are closed by engagement of the closing door with an intervening object with closing of the contacts actuating the circuit means to reverse the direction of movement of the door. The contacts comprise a pair of elongated electrical conductors that are series connected with the operating coil of a relay switch which is connected in the circuit means to cause the direction of movement of the door to reverse, if initially moving to a closed position, should the contacts be caused to engage or if the interconnecting electrical conductors should either be inadvertently broken or grounded, thereby providing a fully fail-safe circuit.

3,651,333

CONTROLLER BY-PASS TRANSFER STATION FOR AN ELECTRON PROCESS CONTROL SERVOSYSTEM

Jack Goldberg, and Louis H. Fricke, Jr., both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 2, 1970, Ser. No. 24,988
Int. Cl. G05f 1/56
U.S. Cl. 307—130 **12 Claims**



The controller bypass transfer station disclosed herein is operative to be connected electrically in parallel with a main automatic process controller of a process control system. The transfer station includes a differential amplifier and its associated voltage balance control circuitry, and a DC control potential from this voltage balance control circuitry is adjusted so that the difference of potential between the transfer station circuit output node and a voltage supply terminal is made equal to the difference of potential developed across a final control element of the process control system. The transfer station current, which is proportional to this voltage, can therefore be made equal to the same current flowing simultaneously through the final control element and the automatic process controller. Thus, when the transfer station is connected to provide an alternate current path for the final control element, and the automatic process controller is electrically disconnected from the final control element, there is no undesirable interruption in the current flowing in the final control element and a "bumpless" transfer is achieved. The transfer station described herein also includes means for sourcing current to or sinking current from a process control system to also achieve a bumpless transfer when the main controller is reinserted in the system.

3,651,334

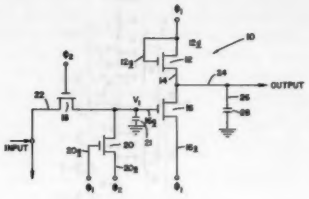
TWO-PHASE RATIOLESS LOGIC CIRCUIT WITH DELAYLESS OUTPUT

Andrew V. Thompson, and Richard F. Herlein, both of Sunnyvale, Calif., assignors to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Dec. 8, 1969, Ser. No. 883,066
Int. Cl. H03k 17/60
U.S. Cl. 307—208 **5 Claims**

A logic circuit providing a delayless inversion of a data input signal which employs one clock phase for simultaneously precharging the output node and discharging a storage node that is the gate of a logic transistor and is connected to the data input through a gating transistor. A second clock phase causes the gating transistor to conduct and, depending

on the data input signal, the input node either remains discharged or is charged negative, thereby causing the output



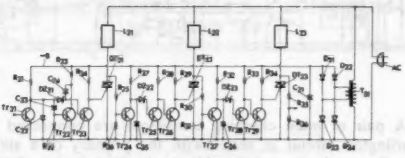
node to either remain negative or to be discharged through the logic transistor.

3,651,335

ELECTRIC CIRCUIT FOR SEQUENTIALLY OPERATING A PLURALITY OF AC LOADS

Tetsuji Shimizu, and Makoto Iwakura, both of Nagoya-City, Japan, assignors to Kabushikikaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi Prefecture, Japan

Filed Nov. 13, 1969, Ser. No. 876,261
Claims priority, application Japan, Nov. 13, 1968, 43/98321; 43/103577; Feb. 24, 1969, 44/15471
Int. Cl. H03k *17/00*
U.S. Cl. 307—223 B **10 Claims**



An electric circuit for sequentially operating AC loads wherein a plurality of loads are sequentially energized and deenergized substantially simultaneously after said loads are all energized, which consists of a plurality of stages each comprising at least a transistor; a time constant circuit; a Zener diode; and a controlled rectifier element; the Zener current flowing through said Zener diode to a gate of said controlled rectifier element when the voltage at both terminals of a capacitor of said time constant circuit is raised to exceed the voltage predetermined by a time constant of said circuit whereby said controlled rectifier element is turned on, thereby energizing the load. The simultaneous deenergization of the loads is effected at a predetermined time interval after energization of the load of last stage of circuit, and no mechanical type electric contact is used, resulting in elimination of mechanical trouble, so that the operational effect of said circuit is greatly improve, and the range of its application is increased.

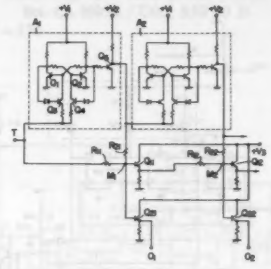
3,651,336

FREQUENCY-DIVIDING CIRCUIT FOR SIGNALS OF SAWTOOTH WAVEFORM

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Apr. 23, 1970, Ser. No. 31,152
Claims priority, application Japan, Apr. 30, 1969, 44/33434; 44/33435
Int. Cl. H03k *21/00, 3/12*
U.S. Cl. 307—225 **3 Claims**

A frequency-dividing circuit for producing a sawtooth wave comprises at least one stage of a square wave frequency divider and a mixing circuit. Receiving a sawtooth wave or a square wave of a known frequency as a trigger input signal, the square wave frequency diver produces a square wave of half the frequency. The mixing circuit includes: resistors for mixing a sawtooth wave of the original frequency and the frequency divided square wave by equal peak amplitudes



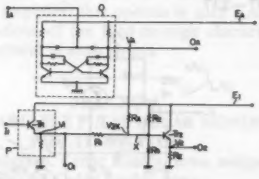
thus producing a sawtooth wave of half the frequency; a transistor amplifier of an emitter follower type for supplying the resultant sawtooth wave to a succeeding state; and a further transistor amplifier of an emitter follower type for supplying the resultant sawtooth wave to an output terminal.

3,651,337

SAW-TOOTH WAVE FREQUENCY DIVIDER CIRCUIT

Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 2, 1970, Ser. No. 42,705
Claims priority, application Japan, June 10, 1969, 44/45039
Int. Cl. H03k *21/00, 3/12*
U.S. Cl. 307—225 **5 Claims**



In frequency divider circuit for saw-tooth wave including a circuit for producing a saw-tooth wave of a frequency *f*, a circuit for producing a square wave having a frequency *f*/2, mixing resistors, and a buffer circuit for obtaining a desired output saw-tooth wave of frequency *f*/2; the peak amplitude of the square wave is so selected as to be greater than the peak amplitude of the saw-tooth wave of a frequency *f* before mixing, and the ratio of the resistances of the mixing resistors is so selected that the peak amplitudes of the square wave component and the saw-tooth wave component in the mixed resultant wave become equal after mixing, whereby the resultant saw-tooth wave of a frequency *f*/2 has an amplitude at least equal to that of the original saw-tooth wave of frequency *f*.

3,651,338

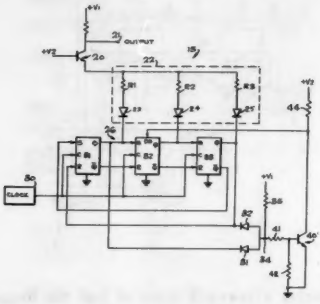
WAVEFORM GENERATOR

William O. Swan, Jr., Saratoga, and David M. Krupp, Palo Alto, both of Calif., assignors to Anderson Jacobson, Inc., Mountain View, Calif.

Filed Nov. 7, 1969, Ser. No. 874,847
Int. Cl. H03k *7/00*
U.S. Cl. 307—227 **4 Claims**

A generator for generating a waveform containing only a fundamental frequency and all odd harmonics except the

third. The generator includes a transistor connected in a common base configuration. The transistor's emitter current is made to be a function of the states of the three stages of a clocked circulating shift register. The current contribution of the middle stage to the emitter's current is twice that of



either the first or the last stage. The register is controlled to circulate through a six state sequence. The output waveform consists of a succession of six step sequences where each of two of the transitions of each sequence has an amplitude which is double the amplitudes of the transitions which precede and succeed it in the sequence.

3,651,339

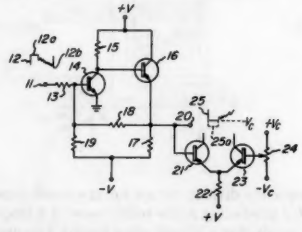
FEEDBACK CLIPPER

Donald Charles Herrmann, Hartsville, Pa., and Lucas John Bazin, Stratford, N.J., assignors to RCA Corporation

Filed Apr. 22, 1970, Ser. No. 30,642

Int. Cl. H03k *5/08*

U.S. Cl. 307—237 **5 Claims**



An amplifier including first and second stages and a feedback loop has an output terminal coupled to a temperature compensated clipping circuit. A signal appearing at the amplifier output terminal and approaching a predetermined clipping level causes a diode in the clipping circuit to conduct. The conduction of the diode alters the feedback to the amplifier such that the altered gain of the amplifier compensates for the nonlinear conduction characteristics of the clipping diode whereby the signal is linearly translated until clipping occurs.

3,651,340

CURRENT LIMITING COMPLEMENTARY SYMMETRY MOS INVERTERS

Steven K. Cliff, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Filed June 22, 1970, Ser. No. 48,007

Int. Cl. H03k *17/60*

U.S. Cl. 307—251 **5 Claims**

Disclosed is a complementary symmetry MOS inverter having a current limiting resistor or diode. The instantaneous current occurring during switching when both transistors are "on" is limited to reduce the average current drawn by the

inverter. This further reduces the already low power drain of the inverter.

3,651,341

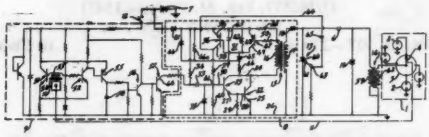
CAPACITOR DISCHARGE PULSE SOURCE

Charles L. Shano, 321 E. Wagon Wheel Drive, Phoenix, Ariz.

Filed May 28, 1970, Ser. No. 41,371

Int. Cl. H03k *17/00*

U.S. Cl. 307—246 **12 Claims**



A pair of main charging transistors are connected in a Darlington circuit in series with the primary of a step-up transformer having a saturable nonlinear core to a battery. The secondary of the transformer is connected in series with diodes to charge a capacitor. A holding transistor connects the base of one charging transistor to the battery. A pair of resistors are connected in series with each other and in series with the main charging transistors. The junction of the resistors is connected to the base of the holding transistor. A bypass transistor in parallel with the one resistor permits turnoff of the holding transistor. A current-sensing resistor is connected across the input elements of the bypass transistor and in series with the primary winding and the main charging transistors. A controlled rectifier or other rapid-acting and gated switch means connects the capacitor to the spark plugs of an internal combustion engine. The gate is connected to the output circuit of the holding transistor by means of a simple capacitor couple and fires to discharge the capacitor upon turn-on of the holding transistor.

3,651,342

APPARATUS FOR INCREASING THE SPEED OF SERIES CONNECTED TRANSISTORS

Andrew Gordon Francis Dingwall, Somerset, N.J., assignor to RCA Corporation

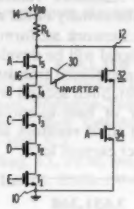
Filed Mar. 15, 1971, Ser. No. 124,208

Int. Cl. H03k *17/60*

U.S. Cl. 307—251 **11 Claims**

Two paths connected in parallel between an output terminal and a point of reference potential. One path is comprised of N field-effect transistors having their conduction paths connected in series and the second path is comprised of two transistors having their conduction paths connected in series, where $N > 2$. One transistor in the second path is turned on concurrently with the transistor in the first path connected to the output terminal and the other transistor in

the second path is turned on in response to the turning on of all of the remaining N−1 transistors in the first path. The



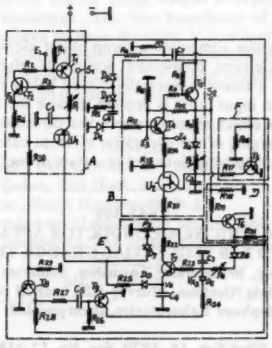
transistors in the second path speed up the production of an output signal.

3,651,343

METHOD OF REGULATION OF THE DURATION OF REPEATED RECTANGULAR ELECTRIC SIGNAL AND DEVICES FOR THE PRACTICAL APPLICATION OF THE SAME METHOD

Louis A. Monpetit, Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Injection Sopromi, Les Mureaux, France

Filed Sept. 20, 1968, Ser. No. 761,117
Claims priority, application France, Sept. 25, 1967, 722241
Int. Cl. H03k *5/04*
U.S. Cl. 307—265 **9 Claims**



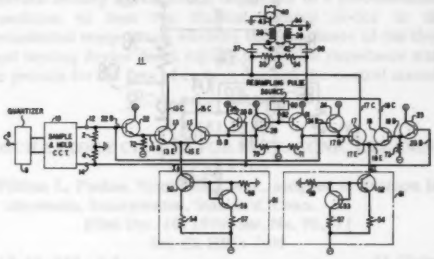
Method and apparatus are disclosed for varying the width of a rectangular pulse which controls the opening of an electromagnetic fuel injector, in accordance with engine speed. Reference pulses of short duration are generated in synchronism with engine rotation and these pulses are utilized to generate injection pulses, and control pulses. The termination of the control pulse, which is of predetermined width, is utilized to generate a linearly increasing reference voltage which reaches a predetermined voltage level, depending on the spacing between the preceding reference pulse and the following reference pulse. The voltage level reached by the reference voltage is utilized to cut off the injection pulse. The width of the injection pulse, and in consequence the quantity of fuel injected, is thus directly controlled by engine speed, i.e., by the spacing of the reference pulses.

3,651,344

BALANCED RESAMPLER

Thomas Edward O'Shea, Laurence Harbor, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 7, 1970, Ser. No. 61,935
Int. Cl. H03k *17/00;* **330** *30 D*
U.S. Cl. 307—270 **4 Claims**



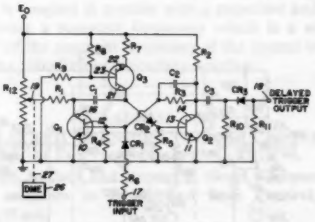
A circuit comprising two differential amplifiers which are driven by the complementary output of a flip-flop circuit is used to generate a balanced polar binary variable duty cycle signal. Each input to the circuit has emitter-follower transistors for low impedance coupling to enhance switching speed of the differential amplifiers. A resampling signal acts to gate the differential amplifiers simultaneously. A polar binary output signal is obtained from a balun transformer which combines the two outputs that are derived from the two differential amplifiers that operate in such a manner that similar contributions of the feed-through characteristics of the circuit are present in each output.

3,651,345

VOLTAGE VARIABLE PULSE DELAY MONOSTABLE MULTIVIBRATOR

Michael W. Lundgreen, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed May 25, 1967, Ser. No. 641,213
Int. Cl. H03k *3/10*
U.S. Cl. 307—273 **3 Claims**



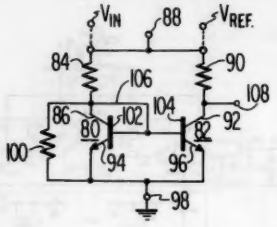
A monostable vibrator connected in a circuit, with a constant current source producing an output which is delayed from an input pulse in time depending upon a control voltage. Variation in the control voltage linearally adjusts the time spacing between the input and output pulses.

3,651,346

ELECTRICAL CIRCUIT PROVIDING MULTIPLE V BIAS VOLTAGES

Allen LeRoy Limberg, Somerville, N.J., assignor to RCA Corporation

Filed Sept. 24, 1970, Ser. No. 75,015
Int. Cl. H03k 1/00
U.S. Cl. 307—296 9 Claims



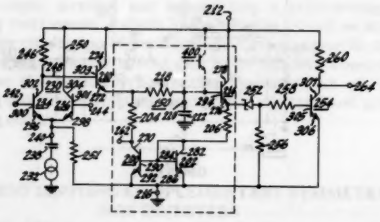
An electrical circuit includes a transistor having base and emitter electrodes coupled in parallel with a PN-junction poled in the same direction as the base-emitter junction of the transistor. A first resistor couples the collector electrode of the transistor to a direct voltage source, while second and third resistors serially couple the source to the transistor's emitter electrode. The base electrode of the transistor is coupled to the junction of the second and third resistors, the resistance values of which are selected to provide a predetermined resistance ratio there-between. With the PN-junction then coupled across the third resistor, the resistance value of the first and second resistors are further selected substantially equal to provide a direct voltage output at the collector electrode of the transistor which is primarily dependent on the predetermined resistance ratio between the second and third resistors and independent of the value of the direct voltage source.

3,651,347

SIGNAL TRANSLATING STAGE PROVIDING DIRECT VOLTAGE TRANSLATION INDEPENDENT OF SUPPLIED OPERATING POTENTIAL

Allen LeRoy Limberg, Somerville, N.J., assignor to RCA Corporation

Filed Sept. 28, 1970, Ser. No. 76,031
Int. Cl. H03k 1/12
U.S. Cl. 307—297 8 Claims



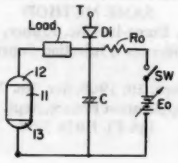
A signal translating stage includes a transistor having base and emitter electrodes coupled in parallel with a PN-junction poled in the same direction as the base-emitter junction of the transistor. A first resistor couples the collector electrode of the transistor to a terminal supplying input signals referenced to a first direct current level, while a second resistor couples the base electrode of the transistor to the emitter electrode of a further transistor, the base electrode of which is coupled via a third resistor to the signal supply terminal. By selecting the resistance values of the first and second resistors to be substantially equal and by providing a signal bypass within the network so formed by these interconnections, an output signal will be developed at the collector electrode of the first mentioned transistor referenced to a second direct current level. Such second level is primarily dependent on the number of base-to-emitter offset voltages between the second and third resistors and independent of the value of the first direct current level.

3,651,348

SEMICONDUCTOR LOGIC DEVICE EMPLOYING THE GUNN EFFECT ELEMENT

Yasuo Matsukura; Toshio Wada, and Kunlichi Ohta, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 3, 1969, Ser. No. 863,566
Claims priority, application Japan, Oct. 7, 1968, 43/73365
Int. Cl. H03k 19/08
U.S. Cl. 307—299 5 Claims



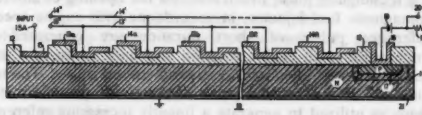
A logic device comprises a Gunn effect element having a capacitive element connected across its electrodes. The Gunn effect element is normally biased below the threshold value, and an input pulse is applied to raise the internal field of the Gunn effect element above the threshold value. The resultant charging of the capacitive element causes the Gunn effect element to be maintained in a state of oscillation.

3,651,349

MONOLITHIC SEMICONDUCTOR APPARATUS ADAPTED FOR SEQUENTIAL CHARGE TRANSFER

Dawon Kahng, Bridgewater Township, Somerset County, and Edward Haig Nicollian, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 16, 1970, Ser. No. 11,448
Int. Cl. H01l 11/14
U.S. Cl. 307—304 16 Claims



In monolithic semiconductor devices of the type wherein storage and manipulation of electronic signals representing information are accomplished by the storage and sequential transfer of packets of excess minority carriers localized in artificially induced potential wells, predictable directionality of charge-packet transfer requires that the potential well be

asymmetrical, at least during the transfer operation. The instant invention includes the use of overlapping gate electrodes and/or nonuniform dielectric thicknesses under the gate electrodes of MIS structures so that an appropriately asymmetrical potential well always is formed whenever a voltage is applied to any gate electrode.

3,651,350

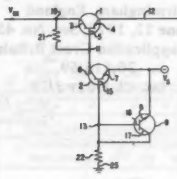
TEMPERATURE-COMPENSATED VOLTAGE SHIFTER

Veikko Reynold Saari, Matawan Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 17, 1970, Ser. No. 64,323

Int. Cl. H03k *1/04, 1/12*

U.S. Cl. 307—310 **6 Claims**



A voltage level shifter produces a shift in voltage level that is substantially independent of temperature variations. The voltage shift is made up of the V_{BE} of a pass transistor and the voltage drop across a resistor connected between the collector and base of the pass transistor. The voltage drop across the collector-to-base resistor is maintained by a transistor current source whose output is dependent on the V_{BE} of its transistors. The two transistors of the current source are chosen to have the same V_{BE} temperature coefficient as the pass transistor, thereby substantially canceling the effects of temperature on the circuit except such as are introduced through the supply voltage.

3,651,351

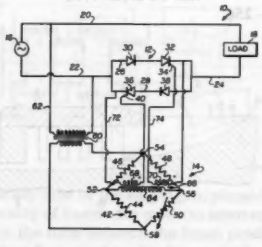
RAPIDLY ACTING CONDITION RESPONSIVE SWITCH

Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., South Hackensack, N.J.

Continuation-in-part of application Ser. No. 584,602, Oct. 5, 1966, now abandoned. This application Dec. 24, 1969, Ser. No. 888,084

Int. Cl. H03k *17/00*

U.S. Cl. 307—310 **3 Claims**



A rapidly acting condition responsive switch for selectively connecting an input circuit with an output circuit which includes a pair of silicon controlled rectifiers connected in inverse parallel relationship between the input and output circuits wherein respective diodes are connected in series with each of the silicon controlled rectifiers to prevent leakage currents from flowing therethrough. Control means is provided to produce gate signals to render the rectifiers conductive. Lead means is adapted to connect an energizing source to the control means. A thermal sensing device which is operable to rapidly change from a high impedance state to a low impedance state at a preselected temperature is provided and is connected with the energizing source and the control means. A heater is in heat exchanging relationship with the thermal sensing device and is responsive to a predetermined condition to heat the thermal sensing device to the preselected temperature whereby the impedance of the thermal sensing device drops rapidly to the low impedance state to provide for the flow of current through the control means.

3,651,352

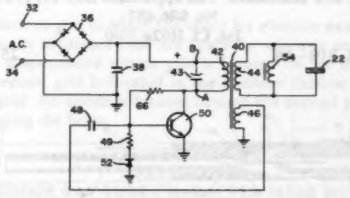
OSCILLATORY CIRCUIT FOR ULTRASONIC CLEANING APPARATUS

William L. Puskas, Trumbull, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Dec. 10, 1970, Ser. No. 96,771

Int. Cl. H01v *7/00*

U.S. Cl. 310—8.1 **15 Claims**



A high-efficient oscillatory circuit drives a piezoelectric crystal (transducer) which is coupled to an ultrasonic cleaning tank. The circuit includes a transistor switching means in the driver side of the oscillator. The primary winding of the transformer is coupled in parallel with a capacitor and forms a circuit having a resonant frequency which is a multiple even integer of the resonant frequency of the crystal which is coupled to the transformer secondary winding.

3,651,353

PIEZOELECTRIC PRESSURE TRANSDUCER WITH ACCELERATION COMPENSATION

Hans W. Hugli, Buffalo, and Vernon H. Siegel, Clarence, both of N.Y., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

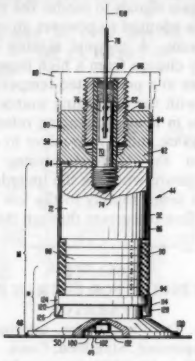
Filed Oct. 13, 1969, Ser. No. 865,651

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.4 **2 Claims**

Disclosed is a microphone in the form of a piezoelectric pressure transducer for detecting high intensity noise. The microphone incorporates a lightweight endpiece, preferably of beryllium metal, having a cavity for receiving an acceleration compensation weight. A preloading sleeve is attached at one end to a support while its other end is slipped over a por-

tion of the endpiece and secured by a retaining ring. The microphone is provided with a separate compartment for



housing an electric circuit receiving the output from the preloaded quartz crystals of the transducer.

3,651,354

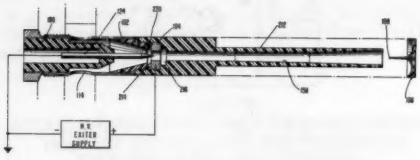
ELECTROGASDYNAMIC POWER GENERATION

Philip L. Cowan, 112 Galloping Hill Road, Basking Ridge, N.J.

Continuation-in-part of application Ser. No. 788,149, Dec. 31, 1968, now abandoned. This application Dec. 19, 1969, Ser. No. 886,487

Int. Cl. H02n *3/00*

U.S. Cl. 310—10 **25 Claims**



Improved constructions for electrogasdynamic power generators wherein localized disruptive disturbance of the streamlined flow path of vapor containing gas therethrough is effected by selectively located sharp edged surface discontinuities in the flow defining channels thereof.

3,651,355

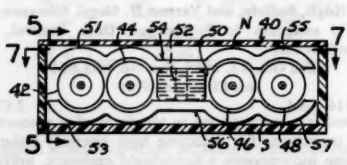
MULTI-ARMATURE MOTORS

Elmer B. Mason, 901 Vickie Drive, Oklahoma City, Okla.

Filed May 8, 1970, Ser. No. 35,685

Int. Cl. H02k *17/02*

U.S. Cl. 310—112 **3 Claims**



A direct current motor having at least two armatures arranged in parallel between parallel magnetic circuits established through the armatures independently exciting the armatures.

In one embodiment a pair of iron core coils, positioned on respective opposing sides of a pair of armatures, provides the magnetic circuit.

In another embodiment an iron core coil, interposed between two or more parallel armatures, forms the magnetic circuit. This common source of magnetic excitation forms parallel magnetic circuits wherein the motor has a dual operating characteristic in that the speed of one armature varies inversely with the speed of the other armature and vice versa until the higher speed armature reaches its critical rpm permitting the load to be increased without further change in the speed of either armature.

3,651,356

WAVE WINDING FOR DYNAMO ELECTRIC MACHINE

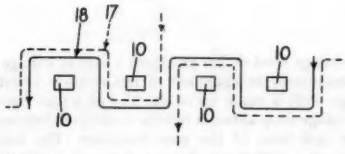
Alec Harry Seilly, North Wembley, England, assignor to C.A.V. Limited, Birmingham, England

Filed June 12, 1970, Ser. No. 45,885

Claims priority, application Great Britain, June, 1969, 30,116/69

Int. Cl. H01v *3/28*

U.S. Cl. 310—180 **1 Claim**



A dynamo electric machine having four pole pieces and windings through which electric current can be passed to polarize the pole pieces, the winding being formed by physically deforming a pair of coils having equal length, the deformation of the coils producing four substantially straight coil portions which are disposed between adjacent pole pieces respectively. The end connectors for each coil are spaced by 180°.

3,651,357

DYNAMO-ELECTRIC MACHINES

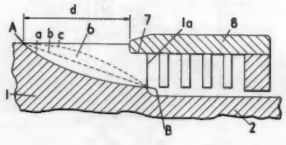
Philip Richardson, Newcastle-upon-Tyne, England, assignor to Reyrolle Parsons Limited, Hebburn, County Durham, England

Filed Aug. 5, 1970, Ser. No. 61,371

Claims priority, application Great Britain, Aug. 5, 1969, 39057

Int. Cl. H02k *1/12*

U.S. Cl. 310—256 **10 Claims**



A rotary dynamo-electric machine comprising a field winding and an armature winding one of which windings is carried by a rotor of the machine so that the magnetic flux due to the field winding moves relative to the electrical conductors in the armature winding when the rotor rotates, both the field

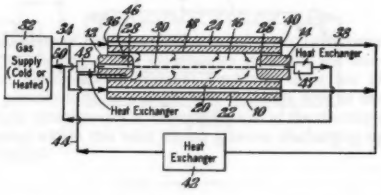
and armature windings being associated with cores of magnetic material through which the magnetic flux circuit of the machine passes, in which machine the cross-sectional area of the magnetic core associated with the field winding is progressively reduced, at least in the regions of the magnetic poly centers, at the axially opposed ends of the core so as to progressively increase the reluctance of the magnetic flux circuit towards the axially opposed ends of the cores.

3,651,358

METHOD AND APPARATUS FOR EXTENDING THE USEFUL LIFE OF AN ARC RADIATION SOURCE

Harden Henry Troue, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,381
Int. Cl. H01j *1/02*
U.S. Cl. 313—12 **5 Claims**



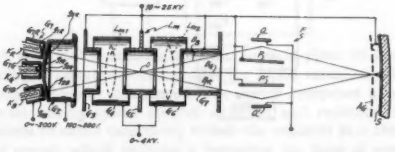
An arc radiation source having a pair of concentric envelopes, the inner envelope of which defines the arc chamber, and including a cooling system comprising means for passing a gas coolant between the envelopes, and means for thereafter passing the gas into the arc chamber in a direction coaxial with the gas flow between the envelopes, the gas being continuously recirculated in a closed loop.

3,651,359

ABBERATION CORRECTION OF PLURALITY OF BEAMS IN COLOR CATHODE RAY TUBE

Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 2, 1969, Ser. No. 829,421
Claims priority, application Japan, Apr. 23, 1969, 44/31398; Apr. 26, 1969, 44/32546
Int. Cl. H01j *29/50, 31/20*
U.S. Cl. 313—70 C **6 Claims**



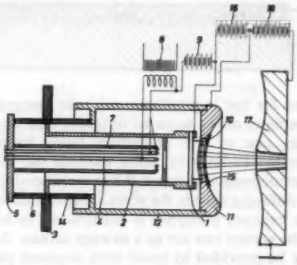
In a cathode ray tube of the single-gun, plural-beam type in which the plurality of beams are made to intersect each other at a location in the tube between the beam producing means and the screen, a focusing lens for focusing all of the beams on the screen is made up of a plurality of lens components arranged in axial succession and defining an optical center of the focusing lens disposed within the latter, and such focusing lens is positioned so that the optical center thereof is substantially at the location where the beams intersect. The lens components of the focusing lens may be symmetrical or asymmetrical with respect to the optical center, and in the latter case may be effective to compensate for any optical aberrations imparted to certain of the beams when the latter are converged to intersect by means of an auxiliary lens.

3,651,360

TRIODE ELECTRON GUN WITH POSITIVE GRID AND MODULAR CATHODE

Jean Sommeria, Annecy, France, assignor to Societe Anonyme Alcatel-Heurtey, Paris, France

Filed Apr. 23, 1969, Ser. No. 818,735
Claims priority, application France, Apr. 26, 1968, 149764
Int. Cl. H01j *29/02, 29/46*
U.S. Cl. 313—82 R **1 Claim**



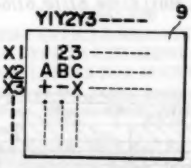
An electron gun in which the space for electron extraction is physically separated from the space for electron acceleration. A non-emissive screen grid is located on the cathode and a second grid is located in the electron shadow of the screen grid. An anode is located beyond the second grid for accelerating the beam.

3,651,361

CATHODE RAY TUBE CHARACTER MASK WITH PLURALITY OF PERFORATIONS FOR EACH CHARACTER

Shigeaki Tanaka; Yoshimasa Tamanaka, and Tadashi Nakamura, all of Ise, Japan, assignors to Ise Electronics Corporation

Filed Oct. 8, 1969, Ser. No. 864,797
Claims priority, application Japan, Nov. 19, 1968, 43/84152
Int. Cl. H01j *29/06, 29/46*
U.S. Cl. 313—86 KM **5 Claims**



A cathode ray tube for displaying characters and the like is provided with a character forming means comprising a character substrate provided with a plurality of character pattern perforations arranged in the form of characters, a plurality of parallel X-axis electrode elements each having a plurality of perforations and a plurality of parallel Y-axis electrode elements each having a plurality of perforations

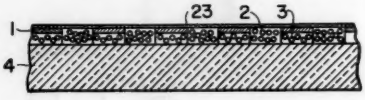
and these X- and Y-axis electrode elements are arranged in a matrix so that a desired character pattern region is determined by selecting the matrix coordinates of the electrode elements to shape the electron beam passing through the region by the character perforations of the character substrate.

3,651,362

SCREENS FOR CATHODE RAY TUBES WITH DISCRETE PHOSPHOR LAYERS

Hajime Takita, Tokyo, Japan, assignor to Iwatsu Electric Company, Limited, Tokyo, Japan

Filed July 22, 1969, Ser. No. 843,408
Claims priority, application Japan, July 23, 1968, 43/52030; 43/52031; 43/52032
Int. Cl. H01j *29/32, 31/68*
U.S. Cl. 313—92 R **6 Claims**



A screen for use in a cathode ray tube comprises two discrete phosphors of the same or different type applied on the face plate, one of the phosphors being exposed to the vacuum in the cathode ray tube whereas the other covered by an electroconductive layer. When irradiated with electron beams of different speeds the screen displays different colors. When the exposed phosphor is constructed to have high resistance the screen can act as a storage screen. A metal back layer may be provided to cover both exposed phosphor and the electroconductive layer.

3,651,363

DIVALENT EUROPIUM-ACTIVATED BARIUM-MAGNESIUM PYROSILICATE

Thomas L. Barry, Beverly, Mass., assignor to Sylvania Electric Products Inc.

Filed Dec. 23, 1968, Ser. No. 785,981
Int. Cl. C09k *1/54;* **H01j** *1/63*
U.S. Cl. 313—109 **8 Claims**

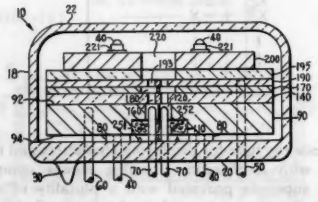
Divalent europium-activated $BaMg_2Si_2O_7$ phosphors are useful in fluorescent lamps. The phosphors have spectral energy distribution curves which peak at 400 nanometers and which have a very narrow emission band.

3,651,364

MULTIPLE CATHODE DISPLAY TUBE

Thomas C. Maloney, Bernardsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 618,138, Feb. 23, 1967, now abandoned. This application Mar. 4, 1969, Ser. No. 806,020
Int. Cl. H01j *61/04, 61/10, 61/64*
U.S. Cl. 313—109.5 **12 Claims**



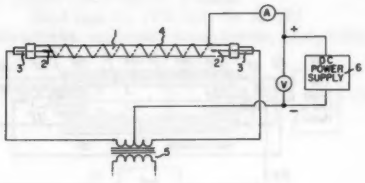
The drawing discloses a tube which includes a large number of cathode rods arrayed in rows and enclosed in cavities in a stack of plates including, from bottom to top, a metal focusing plate for controlling the location of glow on the cathode rods, an opaque insulating disk, an opaque disk shaped to trap cathode sputtering and to prevent the spread of cathode glow from one cathode aperture to an adjacent aperture, and an anode plate.

3,651,365

XENON SLASH LAMP WITH SODIUM STARTING BAND AND METHOD OF MAKING SAME

John F. Waymouth, Marblehead, Mass., assignor to Sylvania Electric Products Inc.

Filed Oct. 9, 1968, Ser. No. 766,162
Int. Cl. H01j *61/35, 61/54*
U.S. Cl. 313—198 **5 Claims**



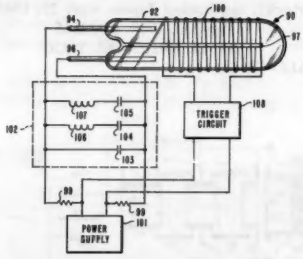
A band of sodium metal is electrolyzed onto the inner surface of a xenon flash lamp glass envelope. The sodium band reduces the ignition voltage required to flash the lamp throughout its useful life.

3,651,366

FLASH TUBE APPARATUS

Gabriel M. Giannini, Indio, Calif., assignor to Giannini Institute

Filed May 28, 1969, Ser. No. 828,526
Int. Cl. H01j *17/04;* **H05b** *37/00*
U.S. Cl. 313—204 **4 Claims**



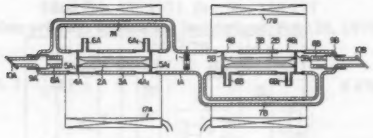
A system is provided for producing repeatable, short-duration pulses of infrared radiation suitable for optical purposes. Radiation is produced by electrically parallel arcs, which are induced within a flash tube containing an inert gas at low pressure and are guided into paths in the form of nonplanar loops whose branches are adjacent one another. The flash tube, which is of a volume sufficient to maintain relatively low gas density during arc discharge, is shaped to accommodate the arc paths and to provide a compact optical source for the radiation.

3,651,367

ELECTRICAL DISCHARGE TUBE

Manabu Yamamoto, Odawara-shi; Shunsuke Tomiyama, and Susumu Saito, both of Tokyo-to, all of Japan, assignors to Kabushiki Kaisha Hitachi Seisakusho, Tokyo-to, Japan

Filed June 16, 1969, Ser. No. 833,345
Claims priority, application Japan, June 21, 1968, 43/43288
Int. Cl. H01j 17/22
U.S. Cl. 313—204 7 Claims



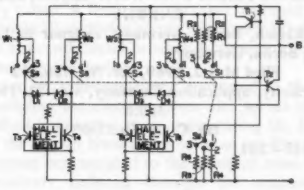
A plurality of capillary discharge tubes are interconnected in serial alignment with orientations such that the mutually nearest electrodes of adjacent discharge tubes are of the same polarity to form a single long discharge tube to thereby eliminate cataphoresis or electrophoresis of the discharge gas occurring within this tube during gaseous discharging operation thereof.

3,651,368

HALL MOTOR INCLUDING MEANS FOR SELECTIVELY VARYING THE EFFECTIVE NUMBER OF TURNS OF THE EXCITING WINDINGS

Toshihide Hanada, Yokohama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 24, 1970, Ser. No. 49,479
Claims priority, application Japan, June 24, 1969, 44/49319
Int. Cl. H02k 29/00
U.S. Cl. 318—254 4 Claims



A Hall motor utilizing Hall elements in place of the conventional commutators provides for speed variation with the motor efficiency unchanged. The motor comprises a control circuit having speed control switches and resistors. Speed control switches selectively switch the resistors into the control circuit which includes a transistor the base of which is controlled by the potential across the resistors. The motor further comprises driving transistors connected with exciting windings of the motor having intermediate taps. Switches are provided for selectively coupling the intermediate taps of the exciting windings to the driving transistors. Hall elements with their voltage terminals connected in the base circuits of the driving transistors are provided for varying the bias to the base circuits of the driving transistors. The speed control switches and the switches for selectively connecting the intermediate taps to the driving transistors are coupled in an interlocked relationship.

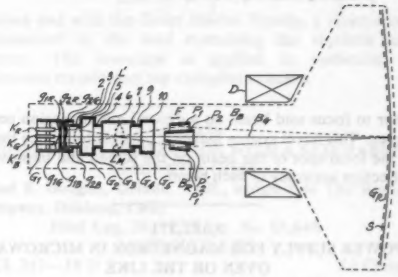
In a modified form of the invention, the Hall motor includes double-pole double-throw switches for changing the flow direction of the exciting current passing through the exciting windings thus providing bidirectional operation as well as variable speed control.

3,651,369

CATHODE RAY TUBE

Masahide Sawai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 24, 1969, Ser. No. 869,025
Claims priority, application Japan, Nov. 13, 1968, 43/83143
Int. Cl. H01j 29/50
U.S. Cl. 315—13 9 Claims



In a cathode ray tube comprising beam producing means to direct a plurality of electron beams from spaced apart locations to impinge on an electron receiving screen, the beams are focused on the screen by a main focusing lens which is common to all of the beams and has an optical center, and an auxiliary lens disposed between the beam producing means and the main focusing lens and having all of the beams passing therethrough with at least two of the beams being at different distances from the optical axis of the auxiliary lens, such auxiliary lens is operative to cause the beams to intersect at the optical center of the main focusing lens and has pre-focusing effects on the beams which are different at least with respect to the said two beams, and an additional focusing lens means is disposed between the main focusing lens and the screen and acts on less than all of the beams to correct for the different pre-focusing effects and thereby cause all of the beams to be focused precisely at the screen.

3,651,370

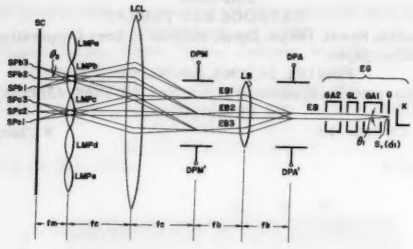
CHARGED-PARTICLE-BEAM FOCUSING AND DEFLECTING SYSTEM UTILIZING A PLURALITY OF ELECTRONIC LENSES FOR FOCUSING THE BEAM

Eiichi Goto, Fujisawa-shi, Japan, assignor to Rikagaku Kenkyusho Hirowasa, Yamato-machi, Kitaadachi-gun, Saitama-ken, Japan

Filed July 18, 1969, Ser. No. 843,128
Claims priority, application Japan, June 12, 1969, 44/46258; July 19, 1968, 43/51061
Int. Cl. H01j 29/70
U.S. Cl. 315—18 8 Claims

This invention relates to a system for focusing and deflecting a beam of charged particles comprising a charged particle gun, means for generating a beam of charged particles and electromagnetically deflecting the emitting direction of the beam and a surface or screen to be illuminated with said beam, characterized by the fact that at least two sets of

means for deflecting the charged beam are provided between said beam generating means and said screen, so that the position and direction of incidence of said beam upon said lens or group of lenses can be controlled independently of each



other to focus said beam on a desired minute region on said screen. This novel system makes it possible to reduce the size of the focal spot of the beam on the screen and improve the deflection accuracy of such beam.

3,651,371

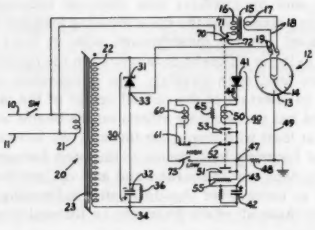
POWER SUPPLY FOR MAGNETRON IN MICROWAVE OVEN OR THE LIKE

Egbert M. Tingley, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Sept. 3, 1970, Ser. No. 69,346

Int. Cl. H03b *9/10;* **H05b** *9/06*

U.S. Cl. 315—102 **12 Claims**



A power supply for a permanent magnet type magnetron tube in which a high impedance transformer furnishes power to two half-wave, oppositely poled voltage doubler circuits in which a time delay is provided, responsive to the load current of the magnetron, to delay the turning on of one of the half-wave voltage doubler circuits to insure operation in the desired oscillating mode. Switching of the second half-wave voltage doubler into the circuit is accomplished by normally open contacts on a main relay, preferably shunted by high value resistor. In the preferred modification additional time delay is achieved by employing an auxiliary time delay relay to inhibit operation of the main relay, thereby to establish successive low power and high power modes. The filament of the magnetron is preferably fed by a separate filament transformer turned on at the same time as the high impedance transformer, but which includes means for lowering the filament voltage incident to switching to the high power mode.

3,651,372

WARNING INDICATOR APPARATUS FOR USE IN A CAMERA HAVING A FLASH DISCHARGE DEVICE CONTAINED THEREIN

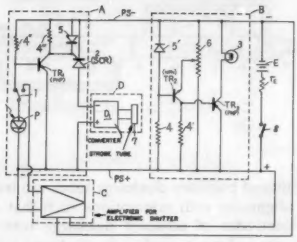
Yasuo Uchida, and Hideo Akimoto, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

Filed Aug. 6, 1970, Ser. No. 61,673

Claims priority, application Japan, Aug. 9, 1969, 44/62752

Int. Cl. G03b *15/05;* **H05b** *41/30*

U.S. Cl. 315—134 **3 Claims**



A warning indicator apparatus for use in an automatic exposure camera having a flash discharge device, a warning lamp and strobe flash equipment which strobe flash equipment containing a capacitor for flashing the strobe. In one embodiment the warning indicator apparatus comprises a single warning lamp lighted by means of semiconductor devices during the charging of the capacitor. In an alternative embodiment, the lamp is normally energized by a power source. Alternate shunting circuits are provided, one turning off the lamp when the photographic subject has a brightness higher than a predetermined reference value and the other turning the lamp off when the capacitor has been completely charged.

3,651,373

ELECTRONIC FLASH UNIT WITH ADJUSTABLE FLASH ENERGY

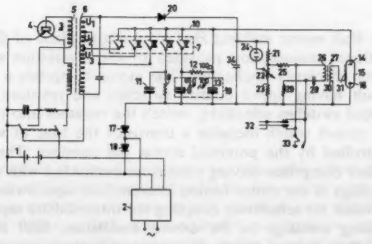
Joachim Ratsch, Berlin, Germany, assignor to Loewe Opta GmbH, Berlin, Germany

Filed May 2, 1969, Ser. No. 826,302

Claims priority, application Germany, May 22, 1968, P 17 64 360.6

Int. Cl. H05b *37/00*

U.S. Cl. 315—241 **8 Claims**



An electronic flash unit with flash energy adjustable by switching on or off storage capacitors interconnected in parallel which are connected to a high-tension source. For increasing the number of flash energy stages (guide numbers)

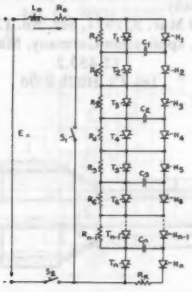
obtainable with a definite number of storage capacitors an energy switch is provided with whose contacts the storage capacitors can be as required connected in parallel and are at the same time connectable at various high potentials of the high-tension source.

3,651,374

SWITCHING ARRANGEMENT FOR DISCONNECTING HIGH-VOLTAGE DIRECT-CURRENT LINES

Werner Faust, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Feb. 17, 1971, Ser. No. 116,177
Claims priority, application Switzerland, Feb. 20, 1970, 2422/70
Int. Cl. H02h *7/22;* **H03k** *17/72*
U.S. Cl. 317—11 A **6 Claims**



A switching arrangement for disconnecting a high-voltage direct-current line includes a commutation device constituted by even number of main electric valves of the controllable semiconductor type each of which except the last as seen from the positive terminal of the line is paralleled by an ohmic resistance, an auxiliary valve correlated to each of the main valves and which are also connected in series, and commutation condensers between the cathode sides of the main and auxiliary valves. A first circuit breaker arranged in series with the commutation device serves to connect the device to the line and a second circuit breaker is connected in parallel with the commutation device.

Transmission of a disconnecting command to the circuit breaker paralleling the electric valves also serves to render the main valves conductive thus commutating the load current so that the circuit breaker opens in an arc-free manner. The load current commutated to the string of main valves is then progressively reduced through the resistances by sequential ignition of the auxiliary valves which produces a sequential extinction of the main valves. The series connected circuit breaker then opens isolating the load circuit from the high-voltage line.

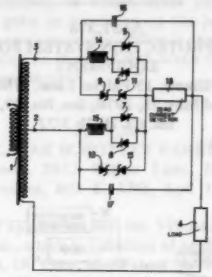
3,651,375

PROTECTIVE CIRCUIT FOR A THYRISTOR TYPE SWITCH

Gerard Ebersohl, Aix-les-Bains, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed May 8, 1970, Ser. No. 35,799
Claims priority, application France, May 8, 1969, 6914830
Int. Cl. H02h *3/00, 7/00;* **H03k** *17/00*
U.S. Cl. 317—11 E **8 Claims**

The invention concerns a protection device for a thyristor type switch comprising a protection circuit consisting of two Zener diodes of opposite conductivity in series with each other and in parallel with the thyristor type switch. In addition a reactance which can be saturated and has slight magnetic losses is connected in series with the thyristor type switch and thus in parallel with the Zener diodes. In modifications of the basic invention a capacitor is connected in parallel with both the lead containing the thyristor and



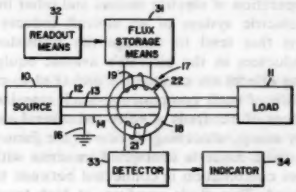
reactance and with the Zener diodes. Finally, a resistor can be connected to the lead containing the thyristor and reactance. The invention is applied in particular to synchronous transformer tap changing switches.

3,651,376

GROUND FAULT PROTECTION WITH A SATURABLE MAGNETIC CORE

Ellwood S. Douglas, Orinda, Calif., assignor to The Rucker Company, Oakland, Calif.

Filed Aug. 20, 1970, Ser. No. 65,640
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **12 Claims**



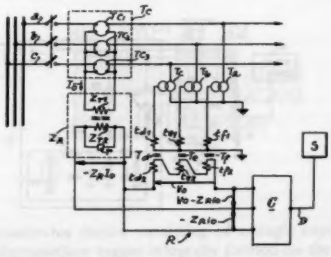
Ground fault protective system utilizing a saturable magnetic core for limiting the level of signals produced by fault currents.

3,651,377

BALANCED CURRENT-DIRECTIONAL RELAY FOR THE DETECTION OF MULTIPHASE LINE DEFECTS

Michel Henry Pierre Souillard, Fontenay-aux-Roses, France, assignor to Compagnie Des Compteurs, Paris, France

Filed Aug. 10, 1970, Ser. No. 62,400
Claims priority, application France, Aug. 11, 1969, 6927551
Int. Cl. H02h *3/26*
U.S. Cl. 317—27 R **4 Claims**



A triphase line current-directional relay includes a reference impedance fed by symmetrical components of the

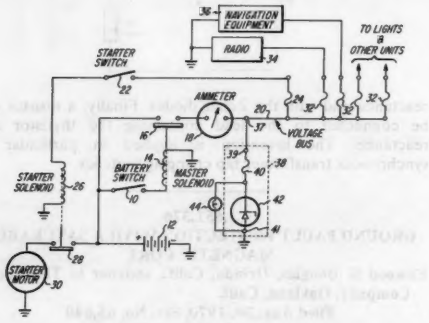
currents, a reference voltage and a phase computer connected both to the reference impedance and to the reference voltage.

3,651,378

TRANSIENT PROTECTION SYSTEM FOR AVIONICS EQUIPMENT

Charles R. McWilliams, 15 Patriot Lane, Willingboro, N.J.

Filed May 21, 1970, Ser. No. 39,360
Int. Cl. H02h *3/22*
U.S. Cl. 317—31 **3 Claims**



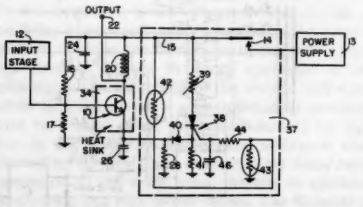
The operation of electric motors and other inductive loads in the electric system of an aircraft induces high energy transients that tend to damage the transistors and other semiconductors in the aircraft's avionic equipment. These damaging effects are cumulative and tend to reduce the effective life of such components. Such transients may have peak values of hundreds of volts and several amperes of current. An energy absorbing device in the form of a reverse-characteristic diode is connected in series with a fuse, and the series combination is connected between the power bus and ground. This diode conducts at high transient voltages and effectively absorbs the energy of such transients and diverts the damaging effects thereof from the avionic semiconductors.

3,651,379

TEMPERATURE RESPONSIVE CIRCUIT FOR PROTECTING AN ELECTRON DEVICE

Brian H. Moisand, Chicago, and William A. Schilb, Lombard, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 30, 1970, Ser. No. 85,427
Int. Cl. H02h *5/04, 7/20*
U.S. Cl. 317—41 **10 Claims**



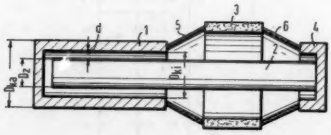
The protection circuit for an electron device includes a silicon controlled rectifier (SCR) selectively triggered by a voltage divider including first and second thermistors. The first thermistor monitors the temperature of a heat sink which is thermally connected with the device, and the second thermistor monitors the ambient temperature. When the sink and ambient temperatures indicate the device is about to overheat, the divider provides a voltage which triggers the SCR to change the bias thereby decreasing the power level of the device. The temperature of the device decreases in response to the decrease in power level. The protection circuit can be used with the power amplifier of a radio transmitter wherein the energizing circuit of the SCR is broken each time the transmitter is keyed to reset the protection circuit.

3,651,380

GAS DISCHARGE OVER VOLTAGE ARRESTER FILLED WITH A NOBLE GAS

Gerhard Peche, and Werner Seiffarth, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 3, 1971, Ser. No. 120,638
Claims priority, application Germany, Mar. 16, 1970, P 20 12 453.2
Int. Cl. H02h *9/06*
U.S. Cl. 317—62 **5 Claims**



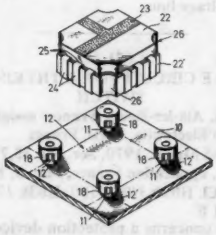
A gas discharge over voltage arrester having a cylindrical electrode coaxially surrounded by a hollow tubular electrode which forms a part of a gas filled vacuum-tight housing. The cylindrical electrode carries an end cap which with the hollow electrode, an intermediate annular insulator and a pair of thin wall connecting portions forms the vacuum-tight housing. The arrester is constructed and arranged to withstand brief high loads and extended low loads, and is dimensioned materially and geometrically to provide optimum performance and to provide a short circuit very rapidly without rupture when overloaded by alternating and lightning loads.

3,651,381

ELECTRONIC DEVICE USING BLOCK UNITS

Takasi Nojiri, 28–4 Aza Chogatsubo, Oaza-Inuyama, Inuyama-shi, Japan

Filed July 1, 1970, Ser. No. 51,493
Int. Cl. H05k *1/04*
U.S. Cl. 317—101 CC **5 Claims**



An electronic device for constructing various electronic circuits by arranging block units substantially in two dimensions comprising block units, which are of a substantial rectangular plane view with an area equal to or integral mul-

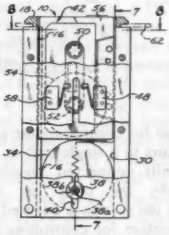
tiple of a unit square, encasing a circuit element such as a resistor or an interconnection and being provided at its four corners with concave surfaces and on its side surfaces with resilient lead pieces which are bending slightly outwards to be deformable inwards and are connected electrically to the circuit element or the interconnection contained in the block unit, a basic board, a plurality of posts set up on said basic boards at vertexes of said unit squares supposed on said board, a plurality of resilient cap members attached to said posts and a case to receive said basic board, said block unit being individually held at said concave surfaces by said resilient cap members.

3,651,382

ERASE MECHANISM FOR A TWO-SPINDLE TAPE CASSETTE

James R. Trammell, Parma Heights, Ohio, assignor to Scanfax Systems Corporation, New York, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,304
Int. Cl. H01f 13/00
U.S. Cl. 317—157.5 **1 Claim**



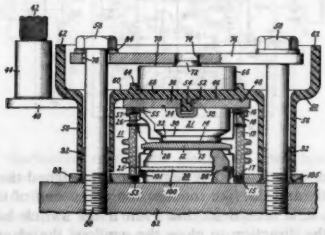
An erase system for degaussing a magnetic tape in a cassette including a receptacle-forming housing defining a receptacle for insertion of the cassette in one orientation and preventing insertion in another orientation. The system also includes a degaussing means mounted for providing a quick and simple degaussing operation whereby the magnetic tape is twice exposed to the field produced by the degaussing means. A mechanism is provided to insure a quick return of the cassette to the operator with the degaussing means being energized by a switch operable by the action of the return mechanism.

3,651,383

UNITARY HIGH POWER SEMICONDUCTOR SUBASSEMBLY SUITABLE FOR MOUNTING ON A SEPARABLE HEAT SINK

John P. Livezey, Broomall, and Daniel B. Rosser, Springfield, both of Pa., assignors to General Electric Company

Filed Feb. 5, 1970, Ser. No. 8,887
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R **14 Claims**



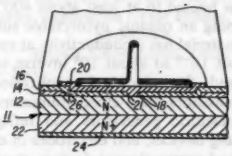
A unitary subassembly which is adapted to be mounted on a heat sink. A pair of bolts is adapted to secure a spring member to the heat sink, and a semiconductor device is captured between the spring member and a retainer. The retainer is releasably fastened to the pair of bolts, whereby the bolts, the spring member, the device, and the retainer form the subassembly in which these parts are properly joined together prior to mounting on the heat sink. A main electrode of the semiconductor device is exposed through the retainer for seating on the heat sink when the unitary subassembly is anchored thereto.

3,651,384

PLANAR SCHOTTKY BARRIER

Warren P. Waters, 5943 Willow Lane, Dallas, Tex., and Byron K. Lovelace, 806 E. 13th, Apt. 102, Georgetown, Tex.

Continuation of application Ser. No. 718,643, Jan. 15, 1968, now abandoned, which is a division of application Ser. No. 397,413, Sept. 18, 1964, now Patent No. 3,388,000. This application Mar. 8, 1971, Ser. No. 122,135
Int. Cl. H01l 9/00
U.S. Cl. 317—234 R **7 Claims**



There is disclosed a high-frequency metal semiconductor junction diode which comprises two layers of insulating material having different etching characteristics so that a very small opening may be formed in the oxides; a metal film is connected to said small exposed area to define a diode construction

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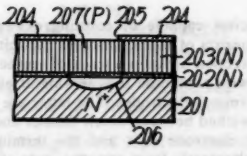
3,651,385

SEMICONDUCTOR DEVICE INCLUDING A POLYCRYSTALLINE DIODE

Isamu Kobayashi, Yokohama-shi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 16, 1969, Ser. No. 858,287
Claims priority, application Japan, Sept. 18, 1968, 43/67380; 43/67382
Int. Cl. H01l 3/00
U.S. Cl. 317—234 **6 Claims**

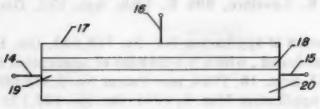


A semiconductor device consisting of a single crystal region, a polycrystalline region integrally formed on the single crystal region and a PN junction formed in the polycrystalline region.

3,651,386

PYROPOLYMERIC SEMICONDUCTING ORGANIC-REFRACTORY OXIDE MATERIAL

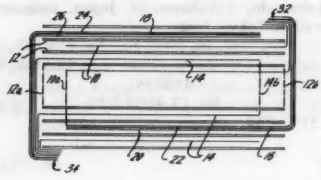
Karl J. Youtsey, Chicago; William C. Holt, Jr., Arlington Heights; Robert D. Carnahan, Barrington, and David H. Spielberg, Wheeling, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 24, 1970, Ser. No. 66,521
Int. Cl. H01l 3/24
U.S. Cl. 317—237 17 Claims

A semiconducting material comprising a carbonaceous pyropolymer formed on a refractory oxide having a surface area of from about 1 to about 500 square meters per gram. A refractory oxide is heated to at least about 400° C. in an atmosphere containing an organic pyrolyzable substance. The semiconducting material has a conductivity at room temperature of from about 10^{-8} to about 10^{0} inverse ohm-centimeters, and is used for electrical applications such as heterojunction transistors, field-effect transistors, thermoelements in thermoelectric generators and refrigerators and temperature sensing devices, and electrodes in electrochemical cells, charge and energy storage devices, memory devices, inductive elements, and a variety of other electrical applications.

3,651,387

STACKED MICA CAPACITORS

James Francis McHugh, Oak Bluffs, Mass., assignor to Cornell-Dubilier Electric Corporation, Newark, N.J.

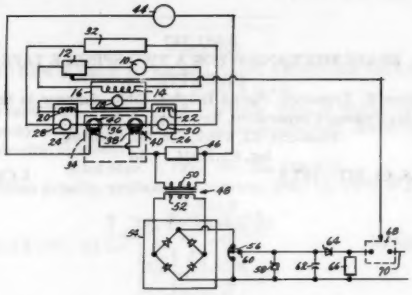
Filed Mar. 18, 1971, Ser. No. 125,729
Int. Cl. H01g 1/01, 1/14
U.S. Cl. 317—258 10 Claims

A capacitor capable of resisting extremely high inertial stresses consists of interconnected capacitor sections. Each capacitor section includes a stack of synthetic mica sheets alternating with aluminum foils serving as electrodes, plus outermost terminal electrodes. The latter are formed of copper foils sandwiched between much thinner and softer aluminum foils. The electrode foils and the terminal electrodes are recessed alternately from opposite ends of the stack in marginal areas and extend respectively outside the opposite ends of the stack and are doubled back over the outer surfaces of the stack in the respective recessed marginal areas. The stack is flattened and is unified by a solidified silicone-resin impregnant. The doubled-back copper foils provide solderable connection areas.

3,651,388

DYNAMIC BRAKING CONTROL SYSTEM FOR PLURAL TRACTION MOTORS

Charles M. Machin, Jr., Ellicott, Md., and John E. Fawcett, Huntington, W. Va., assignors to The Chesapeake and Ohio Railway Company, Cleveland, Ohio and The Baltimore and Ohio Railroad Company, Baltimore, Md.

Filed Apr. 17, 1970, Ser. No. 29,627
Int. Cl. H02p 3/14
U.S. Cl. 318—88 11 Claims



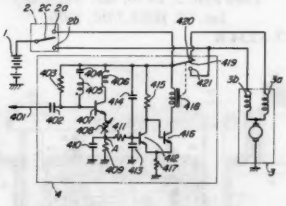
A control system for controlling the condition of a plurality of electric motors in a single unit or a plurality of electrically powered units connected together for multiple unit operation whereby the units are enabled to operate uniformly. Where the system is adapted for use as a dynamic braking control system for controlling the dynamic braking of a plurality of electric traction motors in a plurality of electrically powered vehicles connected together for multiple vehicle operation, the system enables the percent of maximum braking which occurs in each vehicle to be equal so that each vehicle exerts the same percentage braking effort with respect to ever other vehicle in the multiple vehicle arrangement.

3,651,389

SAFETY DEVICE FOR USE WITH AUTOMATIC AUTOMOBILE WINDOW REGULATOR

Shigehiko Ito, Kariya-shi, and Hiroshi Arai, Toyota-shi, both of Japan, assignors to Nippon Denso Kabushiki Kaisha, Showa-cho, Kariya-shi, Aichi-ken, Japan

Filed Nov. 3, 1969, Ser. No. 873,320
Claims priority, application Japan, Nov. 9, 1968, 43/97823
Int. Cl. H02p 1/22
U.S. Cl. 318—266 5 Claims

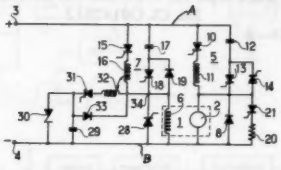


A safe automatic window regulator so designed that if the human body and the like touches the upper end of the window glass, it is sensed so that even if the switch has been closed in the direction to close the window, the electric circuit is automatically changed over so as to reopen the window thereby preventing harm to the human body and the like due to any inadvertency.

3,651,390
METHOD AND ARRANGEMENT FOR QUENCHING A BRAKING THYRATRON FOR MOTORS

Gilbert Vidal, Dravell, and Bernard Peron, Villetaneuse, both of France, assignors to Societe Generale de Constructions Electriques et Mechaniques (Alsthom), Paris, France

Filed Apr. 14, 1970, Ser. No. 28,319
Claims priority, application France, Apr. 14, 1970, 6911898
Int. Cl. H02p 3/12
U.S. Cl. 318—269 5 Claims

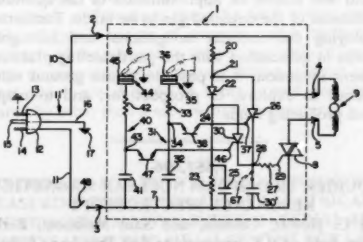


A supply and control circuit for a DC motor having a separately excited field coil and armature, and a method of operating such circuit. The field coil and armature are supplied with current interrupters. Connected in parallel with the separately excited field coil of the motor there is a first thyristor which plays a "free wheeling" role. A second circuit connected in parallel with the field coil includes an inductance, a second thyristor, and a zener diode connected in series. A condenser is connected in parallel with the zener diode. A diode is connected in parallel with the inductance and first thyristor. The parts are so arranged that the firing of the principal thyristor of the current interrupter for the field coil of the motor, after the operation of braking the motor, produces the extinction of the second thyristor, thereby bringing the current flow in the field coil to zero. When the current flow has been restored to its positive value and attains a predetermined potential, the principal thyristor in the interrupter which supplies the armature of the motor with current may be fired to restore the functioning of the motor as a driving motor.

3,651,391
ELECTRONIC SWITCH ARRANGEMENTS

Walter H. Vogelsberg, Carversville, Pa., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 26, 1969, Ser. No. 861,233
Int. Cl. H01h 3/14
U.S. Cl. 318—446 40 Claims

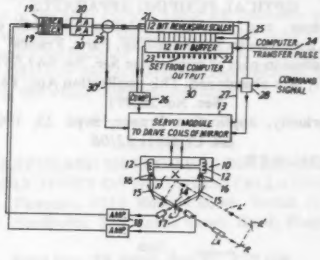


This disclosure relates to electronic switches in which touch elements, separate from each other, must be touched to actuate the electronic switch to operate a load. In a first embodiment, the electronic switch energizes a load when the operator brings his finger near or touches a first touch element, and the electronic circuit deenergizes the load when the operator's finger is removed from the first touch element. A second touch element latches the electronic switch on when the operator touches or brings his finger close to the second touch element. Unlatching is then accomplished by momentarily touching the first touch element. In a second embodiment, the circuit is of the "AND" type and the operator must touch two touch elements continuously to maintain the electronic switch on and the load energized. In a third embodiment, two touch elements must be touched simultaneously to initially energize the load and thereafter the operator need only maintain his touch on or near one of the touch elements to maintain the load energized. In all the embodiments, the electronic switch is of the solid state type and is packaged in a small size electronic module capable of being mounted within the handle or casing of tools or appliances such as a portable electric drill, a router, or a grinder. In each embodiment, two SCR's each controlled by its respective touch element, cooperate to trigger a triac on for full wave conduction, or for half wave conduction, if desired.

3,651,392
BANG-BANG MIRROR POSITION SERVOMECHANISM CONTROLLING A LASER SCANNING DEVICE FOR USE IN A TRACK-FOLLOWING MACHINE

Otto R. Frisch, 22 Warts Causeway; and Graham S.B. Street, Pembroke College, both of Cambridge, England

Filed Nov. 10, 1969, Ser. No. 875,139
Claims priority, application Great Britain, Nov. 12, 1968, 53,685/68
Int. Cl. G05b 13/00, 19/36
U.S. Cl. 318—561 8 Claims



Apparatus for steering a light beam, suitable for use in a track-following machine, in which two steering mirrors are each controlled by a servomechanism which determines the position of the mirror by counting interference fringes from an interferometer and which accelerates the mirror to the midpoint of its movement and then decelerates it, the approach to the final position being controlled asymmetrically in dependence upon the divergence from the set position to apply a larger force when the mirror is moving away from the required position.

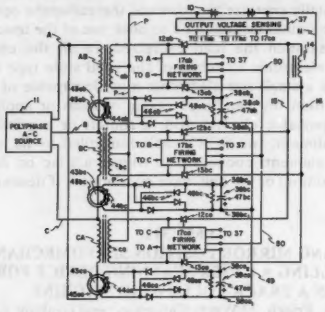
3,651,393
CURRENT EQUALIZING CIRCUIT

George H. Pohm, Lorain, Ohio, assignor to Lorain Products Corporation

Filed Apr. 21, 1971, Ser. No. 135,982
Int. Cl. H02m 7/00; H02h 3/00; G05f
U.S. Cl. 321—5 7 Claims

A circuit for equalizing the AC input currents drawn by a polyphase rectifier. A plurality of sensing networks are connected in current sensing relationship to respective phases of a polyphase source, each sensing network providing an output voltage which is proportional to the current sensed thereby. The outputs of these sensing networks are connected in parallel to establish a plurality of circulating currents, the magnitude and direction of each circulating cur-

rent being dependent upon the output voltage of all sensing networks. The latter currents are utilized to simultaneously



change each of the sensed currents, as required, to achieve input current equality.

3,651,394

DIFFUSED LIGHT DETECTING CELL FOR AND IN OPTICAL PUMPING APPARATUS

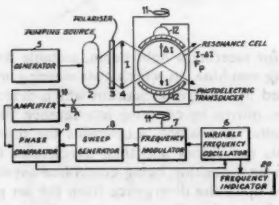
Leon Malnar, and Jean-Louis Meilleroux, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of application Ser. No. 667,557, Sept. 13, 1967, now abandoned. This application Apr. 14, 1970, Ser. No. 28,491

Claims priority, application France, Sept. 23, 1966, 77458

Int. Cl. G01r *33/08*

U.S. Cl. 324—0.5 R **5 Claims**



A vessel, filled with a vapor, the quantum transition of which is to be detected, has photosensitive transducer means applied around the walls thereof in a region remote from the axis of a pumping beam applied to the vessel, so that the photosensitive transducers are responsive to essentially all radiated energy impinging on the walls of the vessel at random angles with respect to the axis of the pumping beam; the cell is included in apparatus including an RF generator of variable frequency, the output of which is coupled to the cell to generate within the cell a radio-frequency electromagnetic field. The frequency of the RF generator is controlled by a feedback control circuit coupled to the output from the photosensitive transducers, so that, when their output is a maximum, the frequency of the RF generator will be locked in.

3,651,395

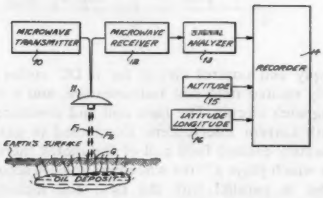
METHOD FOR EXPLORING THE SURFACE OF THE EARTH WITH ELECTROMAGNETIC ENERGY INCLUDING COMPARING RERADIATION CHARACTERISTICS OF GASES TO LOCATE ESCAPING HYDROCARBON GASES AT THE SURFACE EMITTED BY DEPOSITS OF PETROLEUM AND/OR NATURAL GAS AT DEPTH

Robert L. Owen, New York, N.Y., and Julian M. Busby, Muskogee, Okla., assignors to Advanced Geophysics, Inc., New York, N.Y., by said Owen

Filed Sept. 12, 1969, Ser. No. 857,488

Int. Cl. G01v *3/12*

U.S. Cl. 324—6 **6 Claims**



The present invention makes use of the discovery of the fact that producing or potentially producing oil and/or gas fields usually have associated therewith at the earth's surface, the presence of escaping or permeating gases which have risen from underground stratigraphic and structural traps from which oil and/or natural gases may be recovered through drilled wells. Detection of the permeating gases is accomplished by focusing a beam of microwave radiation of known predetermined parameters thereupon, from remote locations, and measuring the parameters of the returned "reflected" microwave signals i.e., signals which are reradiated by the hydrocarbons at the surface. Comparison of the frequency shift, and other parameters of the returned signal with the parameters of the transmitted microwave signal and correlation of the modified parameters of the returned wave with predetermined "microwave re-radiation characteristics" (MRC) of known gases will enable an immediate qualitative identification of a detected gas to be made and will enable an approximation of the quantitative concentrations of the detected gas to be made. Furthermore, by employing conventional navigational and cartographic procedures in association with the gas detecting practices of the present invention, it is possible to use ground vehicles and aircraft to explore, to prospect for, and to map gas and/or oil producing fields.

3,651,396

FOURIER TRANSFORM NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

Richard C. Hewitt, Colonia, and Saul Meiboom, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

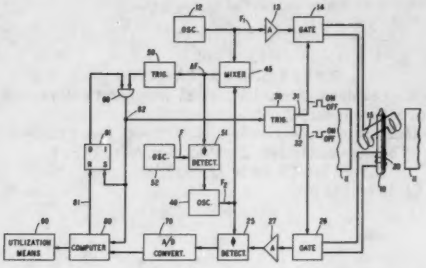
Filed Sept. 4, 1969, Ser. No. 855,206

Int. Cl. G01n *27/78*

U.S. Cl. 324—0.5 R **10 Claims**

Improved NMR spectroscopy is realized by selectively positioning a spectrum excitation pulse with respect to the spectrum of frequencies to be observed. The excitation pulse may be positioned at a frequency anywhere within or outside the spectrum of interest as required. This is achieved by

relating the excitation pulse to a reference signal having a frequency other than the excitation frequency and by maintaining a fixed phase relationship between the excitation pulse and the reference signal.

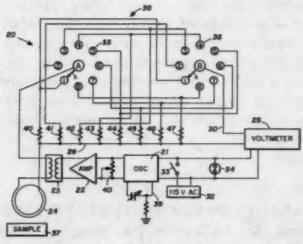


3,651,397

METHOD AND DEVICE FOR TESTING APPARATUS FOR SUSCEPTIBILITY TO MAGNETIC FIELD

David W. Bodenheimer, Carrollton, and Elbert W. Paschetag, Jr., Garland, both of Tenn., assignors to LTV Electrosystems, Inc., Dallas, Tex.

Filed Mar. 9, 1970, Ser. No. 17,650
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 R **8 Claims**



Disclosed is improved apparatus and an improved method for use in testing the susceptibility of electrical apparatus to magnetic fields, wherein current is provided to an antenna for producing a directional magnetic field within each of a plurality of known ranges of intensity and is further varied within each of the respective ranges, as required, to obtain readings corresponding to a voltage falling within a range of voltages which are capable of being sensed and therefore measured by other than a narrow-band voltmeter.

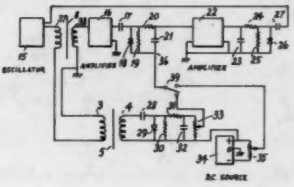
3,651,398

METHOD OF AND DEVICE FOR CONTINUOUSLY MEASURING THE THICKNESS OF ELECTRICALLY CONDUCTIVE MOVING SHEET MATERIAL AND COMPENSATING SAID MEASUREMENT FOR SHEET TEMPERATURE

Laszlo Urmenyi, 18 Ernie Road, London, S. W. 20, England

Filed Aug. 19, 1968, Ser. No. 753,796
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **6 Claims**

The invention refers to a method of and device for continuously measuring the thickness of electrically conductive moving sheet material consisting in providing an eddy current type thickness gauge which is affected by the thickness and temperature of the sheet material, a rotatably mounted tubular metallic body of essentially cylindrical shape which is longer than the width of the sheet material and is in contact with the whole width of the sheet material whereby the sheet material and the metallic body both acquire the same temperature, electrical means are provided to sense the temperature of the metallic body giving an electrical signal and means are provided to apply said signal to the eddy current gauge to compensate automatically for the effect of temperature variations of the sheet material on the thickness measurement. In one example of the invention the electrical means to sense the temperature of the metallic body consists of two coils of which the primary carries alternating current, a disc shaped body which is in thermal contact with said metallic body is positioned between the two coils and the secondary voltage is thus a function of the temperature of the metallic body. Since this latter means is identical with the means used in the eddy current gauge for thickness measurement, the said secondary voltage follows the same law as far as temperature dependence is concerned as the eddy current gauge and therefore the temperature compensation is exactly correct over the whole temperature range.

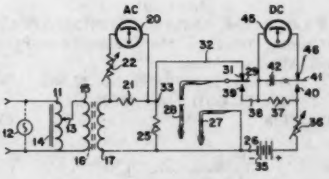


3,651,399

APPARATUS AND METHOD FOR DETERMINING CONDUCTIVITY OF WIRING INSTALLATIONS

Douglas A. Florance, 1110 Hillside Drive, Vestal, N.Y., and Lloyd P. Nordholm, 215 Castle Creek Road, Binghamton, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,108
Int. Cl. G01r *27/00, 31/02*
U.S. Cl. 324—51 **5 Claims**

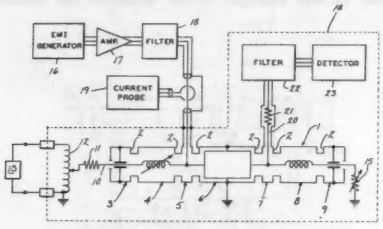


An apparatus and method for determining the conductivity of wiring installations of power distribution circuits is described. Selected portions of the circuit are subjected to alternating and direct current potentials of predetermined magnitude from distinct sources. The resultant currents are alternately indicated on distinct meters at a rate higher than the mechanical inertia thereof, permitting substantially simultaneous visual observation of both indications.

3,651,400
APPARATUS AND METHOD FOR TESTING THE INSERTION LOSS OF ELECTRICAL FILTERS

William J. McMartin, Cedar Rapids, Iowa, and Hans E. Weidmann, Glendale, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed May 26, 1969, Ser. No. 827,674
Int. Cl. G01r 27/00, 27/04
U.S. Cl. 324—57 R 22 Claims

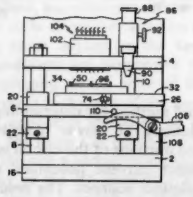


An apparatus for testing electrical filters is disclosed which includes an enclosed cavity made up of a plurality of sections joined to one another with plug-in connections. The cavity has a feed-in capacitor section at each end for introducing a low frequency current representative of a rated load current for a filter under test. The feed-in capacitor sections are each joined to one end of an inductor section, one of which inductor sections represents a power source impedance and the other inductor section representing a load impedance. The inductor sections are each connected at their opposite ends to a test section, one of which introduces high frequency signals representing electromagnetic interference into the cavity, and the other being used for measuring voltage across the load impedance. The cavity is completed by a filter section disposed between the two test sections which houses a filter under test. The complete circuit also includes a source of low frequency current to represent rated filter load, a high frequency generator attached to the test section that introduces high frequencies to the cavity, means for measuring high frequency current delivered to the circuit, and a detector connected to the other test section for reading measured voltage of the load impedance. Use of the apparatus involves a method of testing in which high frequency signals are introduced in parallel with the filter under test and the power source impedance, and measurements of the high frequency source current are made with the filter both in and removed from the circuit for a fixed load impedance voltage, from which current readings the filter insertion loss is calculated.

3,651,401
ARTICLE LOCATING AND POSITIONING APPARATUS

James S. Cooney, Attleboro, Mass., assignor to Pylon Company, Inc., Attleboro, Mass.

Filed Apr. 9, 1970, Ser. No. 27,082
Int. Cl. G01r 31/02; B23g 3/18
U.S. Cl. 324—158 13 Claims

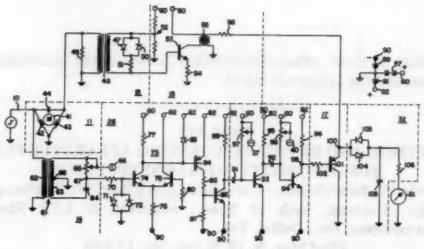


The invention is an apparatus for locating and positioning a wafer containing thereon a miniature printed circuit or integrated circuit on a test apparatus including two tables, one movable on the other. The wafer is first positioned on the one table, the second table is moved to a second position at which the one table is moved to further position the wafer, and then both tables are moved to a test position.

3,651,402
SUPERVISORY APPARATUS

Paul H. Leffmann, Scottsdale, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of application Ser. No. 520,400, Jan. 13, 1966.
This application Jan. 27, 1969, Ser. No. 797,355
Int. Cl. G01r 31/00, 25/00
U.S. Cl. 324—158 MG 5 Claims

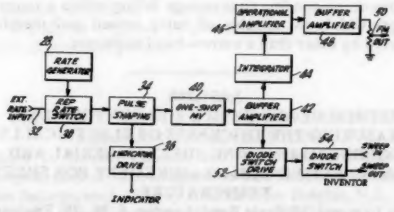


1. The method of testing a hysteresis synchronous motor having a rotor and a pair of stator windings the first of which is energized directly from an alternating voltage source and the second of which is energized from the source through a capacitor, which comprises the steps of energizing the motor, monitoring the phase angle relation between the alternating voltage across said second winding and a reference alternating voltage of preset fixed phase, and confirming the presence in said relation of a characteristic representative of satisfactory motors.

3,651,403
SIMULTANEOUS SWEEP TESTING SYSTEM FOR CATV

Sidney Fluck, Jr., Levittown, Pa., assignor to Jerrold Electronics Corporation, Hatboro, Pa.

Filed May 18, 1970, Ser. No. 38,295
Int. Cl. H04h 1/04; H04b 3/46
U.S. Cl. 325—31 16 Claims

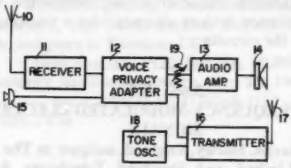


An apparatus and method for applying a test sweep signal onto a CATV line during full operation of the system without introducing observable distortion at the television receivers. The test signal is in the form of a series of discrete frequency-swept pulses of a predetermined duration appearing at a predetermined rate.

3,651,404
VOICE PRIVACY ADAPTER

Thomas J. Rollins, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 12, 1970, Ser. No. 2,238
Int. Cl. H04k 1/00
U.S. Cl. 325—32 15 Claims

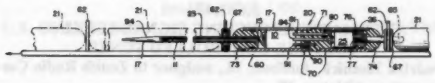


A voice privacy adapter inverts the order of frequencies in a band of frequencies transmitted by radio to prevent unauthorized reception. The adapter includes an input circuit for selecting signals from one of either a transmitter or receiver in a two-way radio. A balanced modulator-chopper heterodynes the modulation signal with signals from a bistable multivibrator which is driven by an oscillator to produce a double sideband, suppressed carrier signal. The upper sideband is attenuated and the lower sideband is coupled to either the transmitter or receiver. The inversion of the signal at the transmitter followed by a second inversion at the receiver restores the modulation signal. Use of the balanced modulator-chopper eliminates all of the frequency components of the modulation signal thereby insuring privacy. The balanced modulator-chopper may be easily disabled allowing use of the radio without frequency inversion.

3,651,405
TELEMETERING TRANSMITTER

John A. Whitney, and Richard E. Woods, both of Fort Wayne, Ind., assignors to Peter Eckrich & Sons, Inc.

Continuation of application Ser. No. 680,111, Nov. 2, 1967, now abandoned. This application Feb. 25, 1970, Ser. No. 18,015
Int. Cl. A47j 37/00; H04b 1/04
U.S. Cl. 325—113 11 Claims



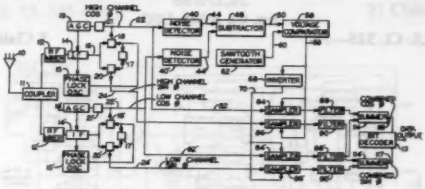
A temperature sensor in circuit with a unijunction transistor drives a tunnel diode FM transmitter for generating discontinuous bursts of a frequency modulated oscillatory output signal. The transmitter is mounted within a unitary housing which is conveyed along with linked meat products whose internal temperature is being monitored.

3,651,406
SYSTEM FOR PLURAL CHANNEL SIGNAL RECEPTION AND READOUT AND METHOD OF OPERATION

John G. Mohr, Woodburn, Ind., and Ross G. Stacer, Niles, Ill., assignors to The Magnavox Company, Ft. Wayne, Ind.

Filed Oct. 3, 1969, Ser. No. 863,473
Int. Cl. H04b 1/12
U.S. Cl. 325—304 12 Claims

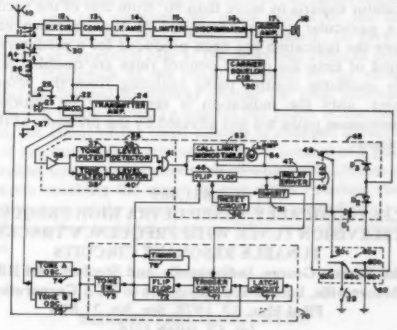
The invention pertains to a radio receiver system, and to a method of operation thereof, in which two channels having the same message thereon are received. The noise levels in the respective channels are measured and the two channels are continuously sampled proportionately on the basis of sampling the quieter channel for a greater length of time than the noisier channel. The samples are combined and the resulting composite signal has a better signal to noise ratio than either channel before sampling. A proportionately combined binary representing signal with its improved signal to noise ratio is further enhanced by bit decoding using integration over a full bit period.



3,651,407
AUTOMATIC ENCODER-DECODER CIRCUIT FOR RADIO COMMUNICATIONS UNIT

John F. Sarallo, Arlington Heights, and George W. Shetzley, Roselle, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 5, 1970, Ser. No. 77,958
Int. Cl. H04b 1/48
U.S. Cl. 325—18 9 Claims



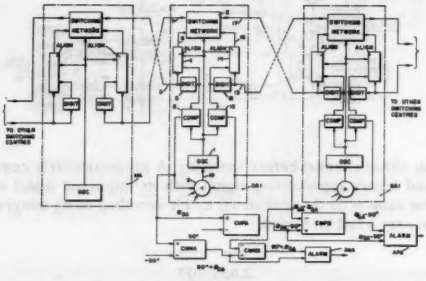
An encoder-decoder for a radio communications unit includes oscillator control circuitry, actuated for a predetermined period of time in response to initiation of a transmission. The oscillator control circuitry actuates oscillator circuitry for applying one or more tones to the transmitter, disables the tone decoder, and is then inhibited from further activating the oscillator circuitry. The decoder is operative in response to the receipt of one or more tones of particular frequency to render the receiver audio operative in response to carrier squelch signals, and inhibits subsequent operation of the oscillator control circuitry. Placing the microphone in the hang-up box at the end of a message resets the encoder-decoder. A subsequent transmission will now include the tone signals and the receipt of the correct tone frequencies will be required to again enable the receiver circuitry. A select switch allows the communication unit to be operated with or without the automatic encoder-decoder squelch circuit.

3,651,408

DIGITAL COMMUNICATION SYSTEMS

Michael Robert Miller, Watford, England, assignor to Her Majesty's Postmaster General, London, England

Filed May 26, 1969, Ser. No. 827,680
Claims priority, application Great Britain, May 31, 1968, 26,270/68
Int. Cl. H04b 1/00
U.S. Cl. 325—58 **8 Claims**



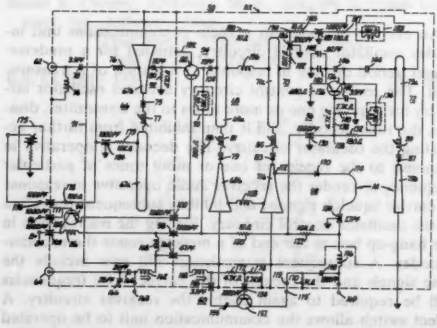
A digital communications system including a plurality of transmission centers interconnected by transmission paths, in which each center has a local oscillator determining the digit times at that center and the frequencies of the oscillators are controlled in response to the adjacent oscillators by reference to incoming signals. In such a system it has been found that incorrect modes can be set up in which large phase differences between oscillators persist as a result of the presence of closed control rings in the system, and according to this invention the presence of an incorrect mode is detected by obtaining an indication whenever the phase of any oscillator departs by more than 90° from that of the oscillator of a particular center designated as the reference center. When the indication has been produced for a predetermined period of time the closed control rings are disabled leaving only oscillator control paths radiating from the reference center, until the indication is removed. The information transmission paths are not affected by the presence of the indication.

3,651,409

ELECTRONICALLY TUNED ULTRA HIGH FREQUENCY TELEVISION TUNER WITH FREQUENCY TRACKING TUNABLE RESONANT CIRCUITS

John Barrett George, Indianapolis, and Stephen Earl Hilliker, Mooresville, both of Ind., assignors to RCA Corporation

Filed Mar. 23, 1970, Ser. No. 21,898
Int. Cl. H04b 1/26
U.S. Cl. 325—445 **19 Claims**



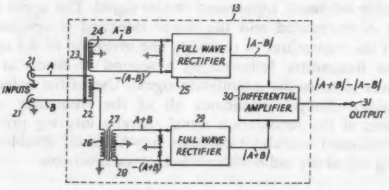
An ultra high frequency (UHF) tuner includes a plurality of tunable transmission lines formed on a dielectric plate. At least two of the transmission lines are tunable over different bands of frequencies and each includes first and second conductive sections, coupled by voltage responsive capacitance devices, disposed on one surface of the dielectric plate, and a conductive ground plane disposed on the other surface overlying the first and second sections. One end of the first section of each of the transmission lines is connected to the ground plane and is shaped to provide tracking as the transmission lines are tuned across their respective frequency bands. An adjustable inductor serially connected with the variable capacitance devices also provides a tracking adjustment between the circuits.

3,651,410

ADDING FREQUENCY-MODULATED ELECTRICAL SIGNALS

Robin Evan Davies, Horley, England, assignor to The Marconi Company Limited and Standard Telephones & Cables Limited, London, England

Filed Oct. 8, 1969, Ser. No. 864,735
Claims priority, application Great Britain, Oct. 10, 1968, 48,149/68
Int. Cl. H04b 1/26
U.S. Cl. 325—446 **7 Claims**



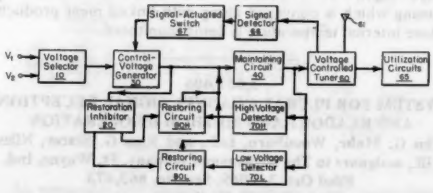
Apparatus for generating an output signal the frequency of which is equal to the sum of the frequencies of two frequency-modulated input signals without demodulating the input signals is used in averaging two frequency-modulated signals and consists of a balanced mixer, and a band-pass filter and an amplitude limiter connected in series to the output of the mixer. The mixer consists of two transformers, two full-wave rectifiers and a differential amplifier connected to generate from two input signals A and B a signal A+B / A−B

3,651,411

AUTOMATIC-RECYCLING SIGNAL-SEEKING VOLTAGE-CONTROLLED TUNER

Fredrick Zlotnick, Addison, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 31, 1970, Ser. No. 68,081
Int. Cl. H04b 1/32
U.S. Cl. 325—461 **4 Claims**



A signal-seeking system for a voltage-controlled tuner wherein automatic recycling is achieved when the control voltage exceeds one limit of the control voltage range. A detector senses the control voltage exceeding its range and activates a restoring circuit which restores a storage capacitor

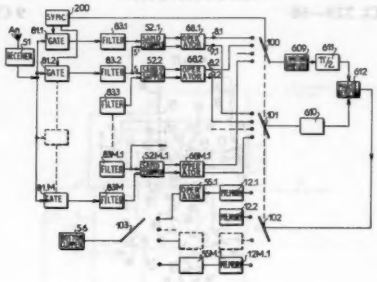
to the voltage corresponding to the opposite end of the control voltage range. A switching circuit is responsive to the restoration operation to automatically shift the control voltage from one tuner to another in a multi-tuner embodiment. The switching circuit is also used to change the scanning rate of the signal-seeking system.

3,651,412

RECEIVERS FOR PULSED SIGNALS

Henri Poinsard, and Marie-Jacques Jullien, both of Paris, France, assignors to Thomson-CSF

Filed Apr. 22, 1970, Ser. No. 30,808
Claims priority, application France, Apr. 28, 1969, 69/13415
Int. Cl. H03k 9/04; H04b 1/10
U.S. Cl. 325—476 **9 Claims**



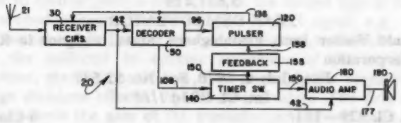
In receivers of pulsed signals of a predetermined duration τ, the useful signal is elaborated as a trigonometric function of the phase angle ϕ between the sum signal Σ and difference signal of two samples, A, and B, of a received pulse at respective instants differing by t, t being smaller than τ.

3,651,413

COMMUNICATION RECEIVER INCORPORATING TONE OPERATED PULSER CIRCUIT AND ELECTRONIC SWITCH

Keith H. Wycoff, P.O. Box 308, Lexington, Nebr.

Filed Sept. 29, 1969, Ser. No. 861,719
Int. Cl. H04b 1/06
U.S. Cl. 325—492 **28 Claims**



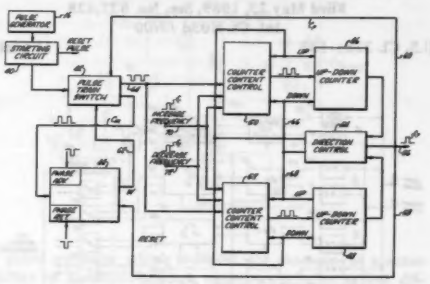
A communication receiver comprising a processing circuit for receiving modulated carrier signals and detecting one or more control tones therein, a pulser circuit coupled to the processing circuit and operative to produce a series of pulses for intermittently rendering the processing circuit operative, and a decoder circuit coupled to the processing circuit and responsive to the control tone or tones for generating at the output thereof a control signal, the pulser circuit being coupled to the output of the decoder circuit and responsive to the application thereto of the control signal to furnish a continuous supply voltage for the processing circuit for an interval substantially longer than the duration of each pulse in the series of pulses.

3,651,414

VARIABLE FREQUENCY SYSTEM

Robert S. Jamieson, assignor to Lorain Products Corp., Lorain, Ohio

Filed Apr. 30, 1970, Ser. No. 33,343
Int. Cl. H03k 21/30
U.S. Cl. 328—44 **27 Claims**



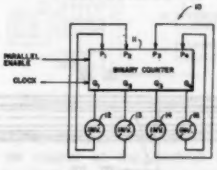
A digital timing system of high precision and stability is provided with a selectively variable frequency and phase by employing a variable frequency dividing circuit that is responsive to a highly accurate precision crystal clock generator. The variable divider includes a fixed modulus counter which in turn triggers a variable modulus counter. High frequency precision clock pulses are fed first to the fixed counter which upon completion of its count, switches the clock pulses to the variable counter. The latter, when it completes its count, provides an output pulse that (a) constitutes one element of the system output, (b) resets the fixed counter, and (c) switches the clock pulses to the fixed counter whereby the above cycle is repeated. To vary the frequency or repetition rate of the described cycle of operation, the magnitude of the count provided by the variable counter is changed to thereby change the total interval or period of a single cycle. To control the phase of the output signal, the count of the fixed counter is changed during but one of its counts. The variable counter is formed of a pair of reversible, up-down counters each of which provides an output upon reaching the count of one when counting down. The frequency of the output is changed by controllably varying the number to which these variable reversible counters count.

3,651,415

BIDIRECTIONAL COUNTER

Jerry M. Glasson, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 21, 1970, Ser. No. 99,881
Int. Cl. H03k 23/24
U.S. Cl. 328—44 **7 Claims**



A clock pulse advances a first count into a binary counter, each clock pulse increasing the stored count by one. To subtract one count from the first stored count, the count is inverted and then increased by one count. The increased and

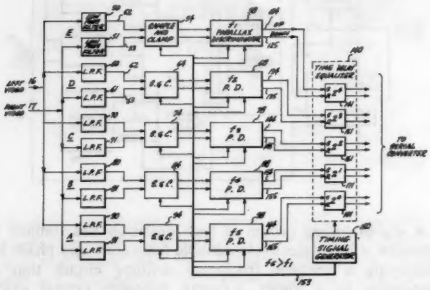
inverted count is then re-inverted, resulting in a final stored count which is one count less than the first count.

3,651,416

DIGITAL PARALLAX DISCRIMINATOR SYSTEM

Gilbert L. Hobrough, Vancouver, British Columbia, Canada, assignor to Hobrough Limited, Vancouver, British Columbia, Canada

Filed May 23, 1969, Ser. No. 827,428
Int. Cl. H03d *13/00*
U.S. Cl. 328—133 11 Claims



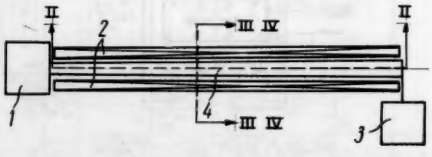
This specification discloses a system which operates on a pair of video signals using digital circuitry for determining the phase relationship between the two signals. The system is particularly adapted for determining the parallax between the left and right video signals in an orthophoto printer system of the type disclosed in my copending application Ser. No. 760,435, filed Sept. 18, 1968. The left and right video input signals derived from the stereophotograph scanning devices in that application are applied to novel frequency band-selection and video-to-digital converter circuits which operate to provide binary signals corresponding to selected frequency bands of the input signals. The output signals from the converter circuits are applied to a plurality of novel parallax discriminators connected in parallel circuit arrangement so that a multi-bit binary representation of the parallax existing between the pair of video input signals is obtained. Details of the overall system as well as of the video-to-digital converters and the digital parallax discriminators are provided.

3,651,417

METHOD FOR LINEAR ACCELERATION OF HEAVY CHARGED PARTICLES AND DEVICE FOR ITS REALIZATION

Alexei Sergeevich Bogomolov, Morskoi prospekt, 16, kv. 40, Novosibirsk, U.S.S.R.

Filed Feb. 17, 1970, Ser. No. 12,015
Claims priority, application U.S.S.R., Feb. 18, 1969, 1303552; 1303551
Int. Cl. H05h *9/02*
U.S. Cl. 328—233 3 Claims



A method for the linear acceleration of heavy charged particles wherein that there is produced a travelling-wave electromagnetic field which propagates against the accelerated beam and whose reverse spatial harmonic is travelling with a velocity which is in synchronism with the velocity of the accelerated beam, and the accelerated beam interacts with the longitudinal electric component of said electromagnetic field.

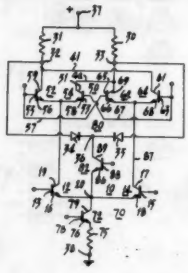
A linear heavy-particle accelerator in which the accelerating system is in the form of a waveguide fitted with means to secure synchronism between the velocity of the accelerated beam and the velocity of the reverse spatial harmonic of the travelling-wave electromagnetic field produced by an oscillator. The oscillator and the heavy-particle injector are coupled to the opposite ends of the waveguide.

3,651,418

SYNCHRONOUS DETECTOR CONTROL

Erwin Johann Wittmann, N. Plainfield, N.J., assignor to RCA Corporation

Filed Nov. 16, 1970, Ser. No. 89,583
Int. Cl. H03d *3/18*
U.S. Cl. 329—50 9 Claims



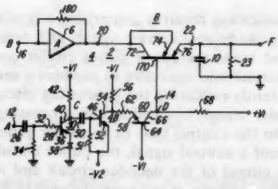
A synchronous detector includes a differential amplifier section formed from two transistors with input signals applied to their base electrodes and output signals taken from their collector electrodes for application to an included synchronous switching section. A current source section is also included to supply substantially constant quiescent current to each of the transistor emitter electrodes, while a control section is additionally included for diverting some of this current away from the differential amplifier transistors when it is desired to reduce the gain of the detector or inhibit its operation. The electrical control section, however, re-inserts the diverted current into the switching section at a point such that the direct output voltage of the detector does not change as the gain is reduced or as its operation is inhibited.

3,651,419

PEAK DEMODULATOR

Donald Walter Janz, Framingham, Mass., assignor to RCA Corporation

Filed July 6, 1970, Ser. No. 52,537
Int. Cl. H03d *1/18*
U.S. Cl. 329—101 6 Claims



A switch is connected between the output terminal of an amplifier receptive of an amplitude modulated carrier, and a

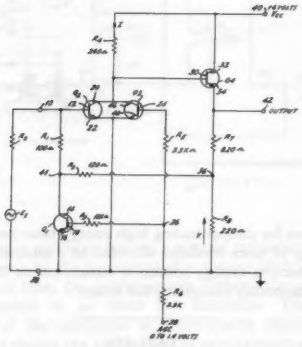
charge storage means. The switch is closed only during each peak of given polarity of an unmodulated carrier of the same frequency as the modulated carrier for permitting the storage means to charge. The time constant of the storage means discharge circuit is sufficiently long so that the storage means does not discharge appreciably during the times the switch is open, whereby a voltage corresponding to the modulation on the carrier develops across the storage means.

3,651,420

VARIABLE GAIN DIRECT COUPLED AMPLIFIER

Kiamil Giontzeneli, Piano, Tex., and Philip E. Hermann, Lansdale, Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Jan. 13, 1970, Ser. No. 2,488
Int. Cl. H03f 3/42; H03g 3/30
U.S. Cl. 330—19 **12 Claims**



A transistor amplifier comprising input circuitry for simultaneously adjusting, in response to a control signal, the gain of a transistor amplifying stage and the magnitude of its input signal, and output circuitry for maintaining constant the DC output voltage of the stage as the gain of the stage is varied.

The input circuitry includes a control transistor whose collector to emitter path is comprised in the output legs of first and second voltage dividers. A gain control signal, e.g., an AGC signal, applied to the base of the control transistor controls the collector to emitter resistance of the control transistor, thereby controlling simultaneously the respective voltage divisions effected by the two dividers. The first divider controls the gain of the transistor amplifying stage by controlling its operating bias, and the second divider determines the fraction of the input signal applied to the amplifying stage.

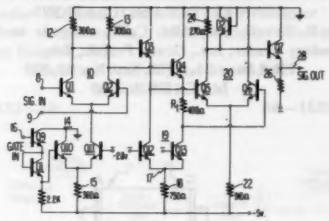
The output circuitry includes a third transistor the collector and emitter of which are directly connected to the collector and emitter respectively of the amplifying transistor and the base of which is supplied with the gain control signal. The two transistors share the same collector load resistor. As the gain control signal varies, the DC collector current of the third transistor changes in a direction opposite to that in which the collector current of the amplifying transistor changes, and by a substantially equal amount. Since the amplifying and third transistors share the same load resistor, the net DC current therethrough remains constant. Hence the DC output voltage of the stage also remains constant.

3,651,421

GATED AMPLIFIER

Howard Raymond Beelitz, Princeton, N.J., assignor to RCA Corporation

Filed June 8, 1970, Ser. No. 44,237
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D **1 Claim**



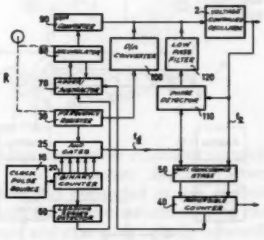
A gated amplifier which is useful, for example, as a sense amplifier in a semiconductor memory includes a first differential amplifier having two normally non-conducting transistors. The two transistors are rendered conductive for amplifying an input signal by a switchable constant-current source responsive to a gating signal. A first normally conducting emitter follower is coupled from the output of one transistor in the first differential amplifier to the input of a corresponding transistor in a second differential amplifier. A second normally conducting emitter follower is coupled from the output of the other transistor in the first differential amplifier through a threshold determining impedance to the input of the corresponding transistor in the second differential amplifier. The second differential amplifier switches in response to an input signal of one polarity exceeding a predetermined threshold, and is unresponsive to common mode signal disturbances coupled thereto from the first differential amplifier.

3,651,422

FREQUENCY SYNTHESISER

Michael James Underhill, Ifield, Crawley, England, assignor to U.S. Philips Corporation

Filed July 29, 1970, Ser. No. 59,066
Claims priority, application Great Britain, July 31, 1969, 38,503/69
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A **6 Claims**



The frequency synthesiser consists of a binary rate multiplier giving an output at the desired frequency of the synthesizer, the output however being spectrally impure. The actual output of the synthesiser is taken from a voltage controlled oscillator; in order to maintain the voltage controlled oscillator at the correct frequency its output and that of the binary rate multiplier are supplied to opposite inputs of an up/down counter. The counter gives an error signal when its

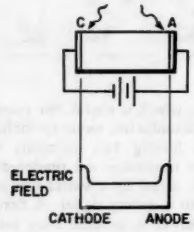
count varies from a predetermined range. The magnitude of the error is obtained from the binary rate multiplier, and the error signals are supplied via an accumulator to a digital-to-analogue converter controlling the voltage controlled oscillator.

3,651,423

LOGIC DEVICE EMPLOYING LIGHT-CONTROLLED GUNN-EFFECT OSCILLATIONS

Kenneth G. Sewell, Palo Alto, Calif., assignor to Advanced Technology Center, Inc., Grand Prairie, Tex.

Filed June 24, 1970, Ser. No. 49,409
Int. Cl. H03b 7/00
U.S. Cl. 331—66 7 Claims



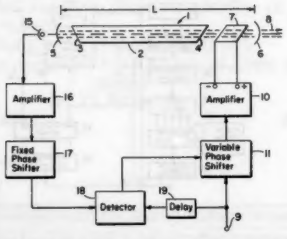
Disclosed is a Gunn-effect device which is sensitive to light, comprising a semiconductor such as a crystal of N-type gallium arsenide having high-resistance, alloyed contacts of, for example, indium and gold, characterized by the capability of being switched on and off by regulating the bias voltage across the crystal and the incident light on narrow portions of the crystal. In particular, incident light on the domain-forming and domain-terminating portions of the crystal is adjusted as to selectively foster or inhibit oscillation of the crystal.

3,651,424

MODE-LOCKED PHASE-STABILIZED LASER DEVICE

Yoshito Ueno, and Youichi Matsumoto, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,641
Claims priority, application Japan, July 24, 1969, 44/58624
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 4 Claims



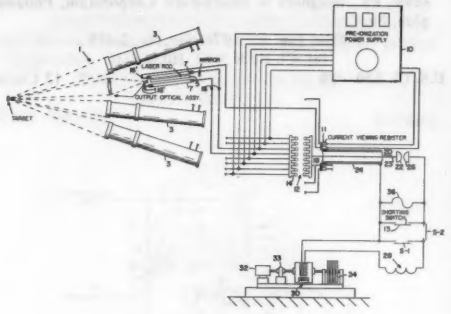
In a mode-locked laser device the phase shift of the output pulse and the mode locking signal are compared. The latter signal is controlled in response to this comparison to thereby maintain the laser output pulse in phase with the mode locking signal.

3,651,425

MULTIPLE UNIT LASER SYSTEM

William B. McKnight, Somerville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 22, 1964, Ser. No. 421,153
Int. Cl. H01s 3/02, 3/09
U.S. Cl. 331—94.5 6 Claims



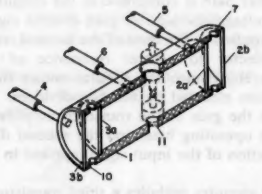
A system for concentrating high energy laser beams having a plurality of laser modules directed to a common point. A single inductive energy source is connected to the modules for simultaneously energizing the lasers.

3,651,426

LIGHT-SENSITIVE GUNN-EFFECT DEVICE

Lynn A. Boatner, Irving, Tex., and Kenneth G. Sewell, Palo Alto, Calif., assignors to Advanced Technology Center, Inc., Grand Prairie, Tex.

Filed June 24, 1970, Ser. No. 49,408
Int. Cl. H03b 7/06
U.S. Cl. 331—107 G 16 Claims



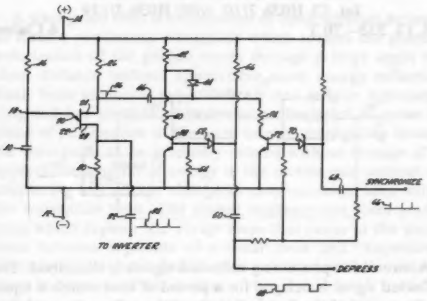
Disclosed is a Gunn-effect device comprising, for example, a crystal of *n*-type gallium arsenide having alloyed contacts (e.g., indium and gold) which is switched from one frequency of oscillation to another by controlling the incident light while maintaining an appropriate temperature and bias voltage. It is believed that trap zones which are localized within

the crystal by virtue of introducing acceptor impurities account for a frequency of oscillation different from the usual transit-time frequency. The Gunn domains and the incident light are made to dynamically perturb the trap system so as to achieve a non-equilibrium condition.

3,651,427
OSCILLATOR SYNCHRONIZATION

Paul E. Rolfes, Costa Mesa, Calif., and Robert S. Jamieson, Guadalajara, Mexico, assignors to Lorain Products Corporation, Lorain, Ohio

Filed Dec. 17, 1969, Ser. No. 885,898
Int. Cl. H03k *3/08*
U.S. Cl. 331—153 **12 Claims**

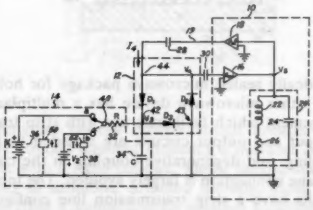


A relaxation oscillator having a natural frequency substantially the same as the frequency of a source of AC power is synchronized from the power source without the use of any DC connection to or from the oscillator. The natural frequency of the oscillator is momentarily depressed just prior to and during the application of synchronizing pulses to the oscillator from the AC source. The arrangement is particularly useful in a standby power supply system which is synchronized to an AC power line at all times and which continues to supply power after the line fails. The standby power, supply includes an inverter that is driven at the AC power source frequency by the synchronized oscillator.

3,651,428
GRADUAL ON-OFF KEYING CIRCUIT FOR AN OSCILLATOR

Richard Brander, Cicero, Ill., assignor to Beltone Electronics Corp.

Filed May 25, 1970, Ser. No. 40,115
Int. Cl. H03b *3/00, 5/08*
U.S. Cl. 331—173 **13 Claims**

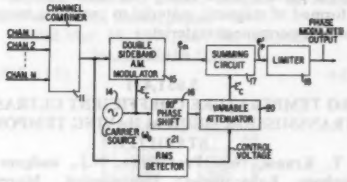


A diode network controls the amplitude of oscillation of an oscillator signal. A resistor and capacitor and series connected keying switch connectable to either one of two DC voltage sources function to vary the bias on the diodes gradually between a first and a second level so that the oscillator may be smoothly keyed on and off.

3,651,429
MODULATOR COMPENSATED FOR VARYING MODULATING SIGNAL LEVEL

Clyde Leslie Ruthroff, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights,, N.J.

Filed Dec. 9, 1970, Ser. No. 96,346
Int. Cl. H03c *3/04*
U.S. Cl. 332—18 **7 Claims**

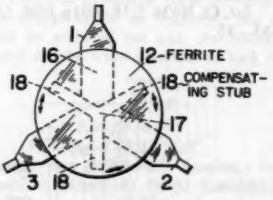


A phase or frequency modulator of the quadrature or Armstrong type is modified such that the amplitude of the quadrature component will be reduced in proportion to any reduction in the power of the modulating signal so that the modulation index remains constant despite variation in the level of the modulating signal.

3,651,430
STRIP-LINE CIRCULATOR HAVING MOVABLE COMPENSATING STUB STRIP OVERLYING CENTRAL STRIP-LINE CONDUCTORS

Yukio Ito; Haruo Yokouchi, and Kenji Konno, all of Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki-shi, Kanagawa-ken, Japan

Filed Sept. 30, 1965, Ser. No. 491,676
Claims priority, application Japan, Oct. 6, 1964, 39/57000
Int. Cl. H01p *1/32, 5/12*
U.S. Cl. 333—1.1 **2 Claims**



1. In a strip-line microwave circulator comprising at least three central strip conductors disposed between parallel outer conductors and connected at one of their ends at a central point with said strip conductors, being parallel to said outer conductors and extending radially outwardly from said point, including predetermined angles with each other, a pair of concentric gyromagnetic discs disposed at said point each between one side of said strip conductors and the adjacent outer conductors, and means to magnetize said discs in a direction substantially at right angle to said conductors, to create microwave circulators switching action; the improvement consisting in the provision of unitary stub conductors disposed between any two adjacent ones of said strip conductors, each of said stub conductors having one end coupled with the junction between the respective strip conductors

and extending outwardly along the symmetry line thereof to a distance being in excess of half the radius and less than the full radius of said discs, said strip conductors being in the form of an integral Y-shaped conducting spider strip with the axes thereof including equal angles of 120° between them, said stubs consisting of a further spider strip concentric with and overlying said first spider strip and movable in a parallel plane relative to the latter so as to compensate for any minor imbalance of admittances at the input terminals of the circulator, said outer conductors comprising a first cover member and a bottom member extending over the respective ferrite discs, a casing ring connecting the first cover member to the bottom member, said means to magnetize said discs consisting of a single permanent magnet extending over said first cover member, a second cover member extending over said permanent magnet, the first and second cover members, a substantial portion of the casing ring and the bottom member being formed of magnetic material to provide a magnetic circuit for said permanent material.

3,651,431

ZERO TEMPERATURE COEFFICIENT ULTRASONIC TRANSMISSION MEDIUM HAVING TEMPORAL STABILITY

John T. Krause, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 5, 1969, Ser. No. 821,693
Int. Cl. H03f *3/68;* **C03c** *3/04, 3/10*
U.S. Cl. 333—30 R **3 Claims**

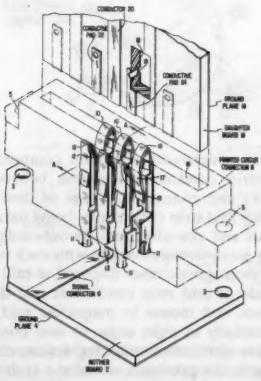
An ultrasonic delay line, having as the delay medium a glass of the nominal composition in mole per cent 17 per cent lead oxide, 95 per cent barium oxide and 73.5 per cent silicon dioxide, exhibits an average temperature coefficient of delay time of not more than about ±5 parts per million per degrees centigrade over the range 0° to 100° C., a thermal after-effect of not more than about 10 p.p.m., and an aging of delay time of not more than −10 parts per million per decade (decade is an order of magnitude of time in days).

3,651,432

IMPEDANCE MATCHED PRINTED CIRCUIT CONNECTORS

Homer Ernst Henschen, Carlisle, and Emerson Marshall Reyner, II, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 14, 1970, Ser. No. 28,485
Int. Cl. H03h *7/38;* **H01p** *3/08, 5/08*
U.S. Cl. 333—33 **9 Claims**



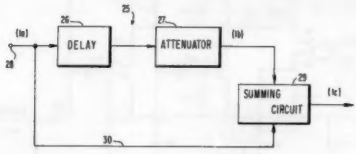
A unique means is disclosed for interconnecting and impedance matching microstrip circuits mounted on printed circuit boards using conventional printed circuit connectors. For coupling and matching a microstrip on one board to a microstrip on another board, the invention utilizes a printed circuit board with novel grounded conductive pads formed thereon. By grounding alternate connector contacts to the ground plane of one of the printed circuit boards and by connecting the conductive pads of the other board to the alternate grounded contacts of the connector, matching is accomplished. Similar matching means are used to match a coaxial line to a microstrip circuit mounted on a printed circuit board.

3,651,433

CIRCUIT FOR PROCESSING REFLECTED SIGNALS

Lawrence W. Langley, Severna Park, Md., assignor to Symbionics, Incorporated, Annapolis, Md.

Filed Mar. 2, 1970, Ser. No. 15,583
Int. Cl. H03h *7/10, 9/00;* **H03k** *5/159*
U.S. Cl. 333—70 T **6 Claims**



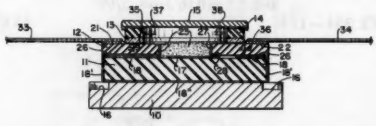
A circuit for processing reflected signals is described. The reflected signal is delayed for a period of time which is equal to the period of the first half cycle of the reflected signal. It is also attenuated by an amount equal to the difference in amplitude between the first and second half cycles of the reflected signal. The delayed and attenuated signal is then combined with the reflected signal so that only the first half cycle of the reflected signal and the last half cycle of delayed signal remain.

3,651,434

MICROWAVE PACKAGE FOR HOLDING A MICROWAVE DEVICE, PARTICULARLY FOR STRIP TRANSMISSION LINE USE, WITH REDUCED INPUT-OUTPUT COUPLING

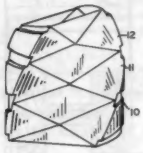
Patrick L. McGeough, Somerville; George J. Gilbert, Whitehouse Station, and Donald F. Henrikson, Somerset, all of N.J., assignors to Microwave Semiconductor Corp., Somerset, N.J.

Filed Apr. 30, 1969, Ser. No. 820,392
Int. Cl. H01p *3/08;* **H05k** *9/00, 1/18*
U.S. Cl. 333—84 M **25 Claims**



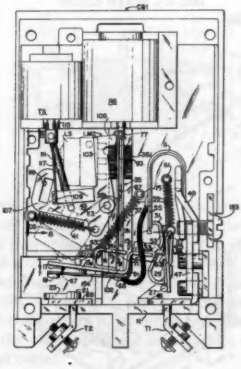
An hermetically sealed microwave package for holding a transistor or other microwave device has a multiplane terminal arrangement which facilitates use with strip transmission line. Input and output circuits are shielded to reduce mutual coupling, and degenerative coupling in the common or ground plane connection is largely avoided. The input and output circuits have a strip transmission line configuration and may be designed for impedance matching purposes. A thermally conductive path is provided from the mounting surface to the exterior, and a heat sink may readily be attached.

3,651,435
GRADED STEP WAVEGUIDE TWIST
Henry J. Riblet, 35 Edmunds Road, Wellesley, Mass.
Filed July 17, 1970, Ser. No. 55,857
Int. Cl. H01p 1/02, 1/00
U.S. Cl. 333—98 R 8 Claims



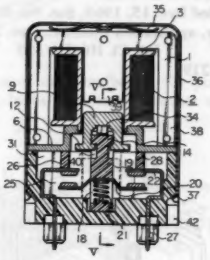
A waveguide twist is constructed of basic sections arranged to form a continuous waveguide which rotates the plane of polarization of the guided waves through a large angle in a short distance without appreciable wave energy reflection. Each basic section is approximately one quarter wavelength long and has portions of its broad walls sloped to cause the plane of polarization of the wave energy propagating through the waveguide to be gradually rotated without storage of an appreciable amount of energy in the section and without encountering any abrupt change in cross-sectional area within the waveguide twist. The sloped wall portions form graded steps which replace the abrupt steps that occur at the transitions between segments of a shear twist and "capacitive" recesses in the basic section are provided to tune out the shunt inductance of the section.

3,651,436
CIRCUIT BREAKER
Lawrence E. Cooper, and Robert W. Peterson, both of Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 2, 1970, Ser. No. 479
Int. Cl. H01h 77/06
U.S. Cl. 335—13 16 Claims



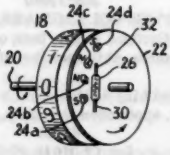
A miniature remote control circuit breaker in which a movable contact member including a movable contact is engageable with a fixed contact. Motor means, such as a solenoid and an armature actuated thereby, move the contact member from a contacts-open position to a contacts-closed position when the solenoid is energized by remote switch means. Preferably a linkage including two resiliently connected driving members is employed to couple the motor means to the contact member. Condition-sensing (e.g., current-sensing) latch means retain the contact member in its contacts-closed position until the condition sensed varies beyond a predetermined value whereupon the latch means releases the contact member, thereby opening the contacts independently of the energization of the motor means. Further latch means are provided to retain the contact member in its closed position. The latter latch means are responsive to further actuation of the remote switch means thereby to release the contact member and separate said contacts. A further solenoid and armature are preferably provided to effect the release of the further latch means in response to further actuation of the remote switch means.

3,651,437
ELECTROMAGNETIC CONTACTOR
Yamada Kiyoshi, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Mar. 19, 1971, Ser. No. 125,950
Int. Cl. H01h 50/00
U.S. Cl. 335—131 4 Claims



A small type electromagnetic contactor including a pivotless carrier for a movable core adapted for stable magnetic coupling to a fixed core and to easy-assembly structure. The movable core substantially of rectangular body and having a reverse U-shaped section has at the lower end of both legs a lateral inward and outward extension so as to provide a downward groove in the body of substantial T-shape. The carrier includes an upward projection of a substantially complementary shape to the T-shaped groove of the core, and the core is resiliently mounted on the carrier projection. The carrier holds in its body a plurality of resiliently movable contacts. Fixed contacts to oppose these movable contacts are arranged in arrays within an insulating box separated from each other by walls of the box. An insulating lock means is mounted on the fixed contacts to lock them in a fixed position.

3,651,438
PULSE GENERATOR
Masayuki Hayashi, and Mitsunori Yamane, Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 24, 1969, Ser. No. 887,943
Claims priority, application Japan, Jan. 6, 1969, 44/1915
Int. Cl. H01h 51/28
U.S. Cl. 335—207 8 Claims



The pulse generator disclosed comprises five magnetic reed switches disposed above a rotary magnetic disc and at

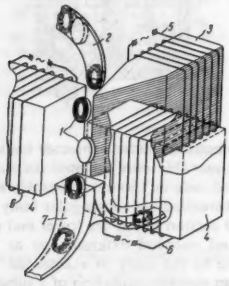
equal angular intervals on a circle concentric with the disc and four permanent magnet pairs disposed on the disc to selectively face the switches during rotation of the disc such that selected two of the switches are put in their closed position for each of incremental rotations of the disc. In this way 10 different coded outputs are provided.

3,651,439

METHOD OF ORIENTING ELECTRICALLY CONDUCTIVE BODIES, PREFERABLY NON-MAGNETIC ONES, IN A MAGNETIC FIELD AND APPARATUS FOR PERFORMING SAME

Benyamin Alexandrovich Ioffe, ulitsa Raunas, 45/2, kv. 81, Riga; Artur Eduardovich Mikelson, ulitsa Miera, 16, kv. 36, poselok Salapils Rizhsky raion; Aron Judovich Makhlin, Schelkovskoe shosse, 67, korpus 2, kv. 6, Moscow; Mikhail Khaimovich Lapidus, ulitsa Suvorova, 70, kv. 9, Riga; Jury Nikolaevich Salnikov, ulitsa Radistov, 8, kv. 9, Gorky; Alexandr Zhanovich Kazhe, ulitsa Bikernieku, 9, kv. 26, and Ivan Avgustovich Trusheliis, ulitsa Aluksnes, 3, kv. 27, both of Riga, all of U.S.S.R.

Filed Dec. 15, 1969, Ser. No. 885,193
Claims priority, application U.S.S.R., Dec. 25, 1968, 1289058
Int. Cl. H01f *1/100*
U.S. Cl. 335—219 **3 Claims**



There are disclosed a method of orienting electrically conductive bodies, preferably, made of non-magnetic materials, in a magnetic field and an apparatus for performing this method, according to which a body is oriented by the action thereupon of a non-uniform magnetic field created by an alternating electric current, by means of a electromagnet, the orientation operation being determined by the features of the body, giving different electric conductivity to the portions of this body, disposed at the opposite sides thereof.

Such method can be used for orienting various articles and workpieces having hidden internal characteristic features, such as flat bi-metal workpieces of non-magnetic electrically conductive articles having asymmetrical opposite sides, or else articles enclosed within an external casing, so that their characteristic structural or technological features are hidden from view.

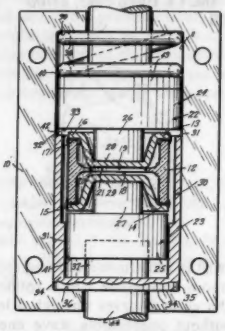
3,651,440

OVER VOLTAGE ARRESTER

Alex Bahr, and Gerhard Lange, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 4, 1970, Ser. No. 34,400
Claims priority, application Germany, May 5, 1969, P 19 22 823.0
Int. Cl. H01h *39/00*
U.S. Cl. 337—31 **3 Claims**

A voltage arrester having a tubular insulating member with a pair of electrodes disposed at opposite ends of the tubular member and facing inwardly thereof. The electrodes are frustum-shaped and have surfaces facing each other and spaced apart adjacent the center of the tubular insulating



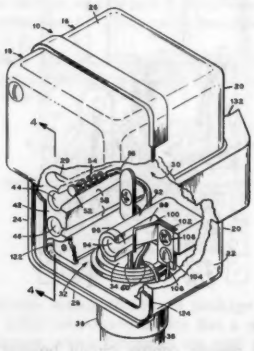
member. A relatively large contact block is placed in good thermal conductive relationship with each of the respective electrodes. The contact blocks are formed of a good thermal conducting material and are slidably disposed in a housing which contains the voltage arrester. The housing is tubular shaped, and a bias spring urges one of the contact blocks together with the insulating member and the associated electrodes toward the other contact block. The other contact block is held in fixed position by a fusible material which when melted allows the entire assembly to slide within the housing. A further electrode is formed as a cylindrical member disposed within the housing and electrically coupled to one of the contact blocks and having a surface positioned to and spaced from the other contact block. When the fusible material is melted, the other contact block is moved into engagement with the surface of the further electrode.

3,651,441

ELECTRICAL JUNCTION BOX

Angelo Boudouris, Sylvania, Ohio, assignor to Eprad Incorporated, Toledo, Ohio

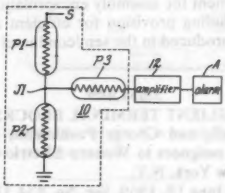
Filed Dec. 1, 1969, Ser. No. 881,073
Int. Cl. H01h *85/50*
U.S. Cl. 337—186 **6 Claims**



An electrical junction box includes a base and a cover, with the cover having fuses mounted thereon and extending outwardly therefrom. An electrical device such as a portable electric heater for a drive-in theater has conductors extending into the cover and electrically connected to ends of the fuses held thereby. The base has recesses to receive the opposite ends of the fuses, when the cover and base are assem-

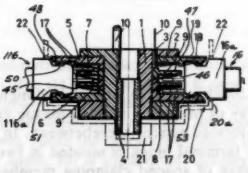
bled, with supply lines supplying power to the fuses through electrical contacts in the recesses. When the cover is removed, the circuit is broken between the fuses and the supply lines in the base, thereby disconnecting the electrical device associated with the cover for safety. The base and cover preferably are made of fiberglass-reinforced plastic or similar insulating material for shock-resistance and durability.

3,651,442
DETECTION DEVICE
Alfred W. Vasel, 222 Linwood St., Abington, Mass.
Filed Dec. 10, 1969, Ser. No. 883,969
Int. Cl. H01c *7/08*
U.S. Cl. 338—17 **5 Claims**



An optical fire detector in which a red-responsive cell and a blue-responsive cell are connected into a voltage divider circuit, and a third cell non-responsive to a specific frequency band is connected between the junction of the first two cells and the input of an amplifier of an alarm circuit.

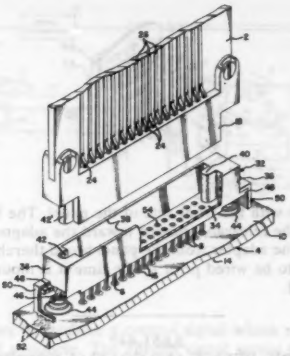
3,651,443
DISTRIBUTOR FOR ELECTRIC CURRENT
Juan Jose Mas Quilez, Santiago Apostol, 91-bis, Hospitaler, Barcelona, Spain
Filed Aug. 4, 1969, Ser. No. 847,347
Claims priority, application Spain, Aug. 2, 1968, 356,838
Int. Cl. H01r *9/00, 13/54*
U.S. Cl. 339—20 **11 Claims**



A distributor for electric current wherein the receptacle comprises a set of insulating walls which define three compartments for ring-shaped conductors. The open sides of the compartments are located at the periphery or at one axial end of the receptacle. The plugs have blades which extend radially inwardly or in parallelism with the axis of the receptacle, and the conductors have axially parallel tongues which extend from the receptacle and can engage complementary terminals in an outlet.

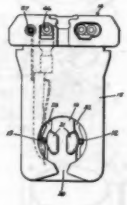
3,651,444
PRINTED CIRCUIT BOARD CONNECTOR
Jerome Andrew Desso, Oberlin, and Homer Ernst Henschen, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed June 23, 1970, Ser. No. 49,061
Int. Cl. H01r *13/44;* **H05k** *1/02*
U.S. Cl. 339—42 **4 Claims**

Electrical connector adapted to receive a mating connector is mounted on panelboard having terminal posts therein. Holes in the connector receive the ends of the terminal posts and connector is resiliently biased above surface of panelboard so as to protect the posts. Upon engagement with the mating connector, the connector is moved downwardly



towards the surface of the panelboard, the posts move relatively through the holes, and enter contact sockets in the mating connector.

3,651,445
LAMPHOLDER
Wallace R. Francis, Milford, Conn., assignor to General Electric Company
Filed Mar. 23, 1970, Ser. No. 21,711
Int. Cl. H01r *9/08, 33/14*
U.S. Cl. 339—53 **5 Claims**

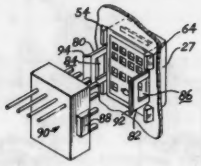


A lampholder for connecting a fluorescent lamp to a supply circuit and for connecting a ballast or other starting circuit for the fluorescent lamp to the supply circuit. The lampholder includes a housing defining an opening for insertion of a lamp connection pin and a contact accommodating recess communicating with the opening. First and second elongated contacts are mounted in the recess in overlying relationship and are held in spaced apart relationship. The first contact includes a planar contact making section which makes a pin seat section of the second contact so the first contact engages the connection pin whenever the second contact engages the connection pin.

3,651,446
PANEL MOUNTING APPARATUS
Walter C. Sadogierski, Park Ridge, and William W. Wright, Wheaton, both of Ill., assignors to Guardian Electric Manufacturing Company, Chicago, Ill.
Filed Nov. 12, 1969, Ser. No. 875,855
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **2 Claims**

An adapter for mounting an electric socket or the like in a panel board. The adapter is shaped to receive and hold the socket. Spaced lugs extend outwardly from opposite sides of the adapter and engage the rear side of the panel. First and

second flanges also extend outwardly from the adapter adjacent the lugs for holding the appliance against the front side of the panel. The flanges are fastened to the adapter by resilient, outwardly biased segments that hold the flanges in



engagement with the front side of the panel. The biased segments may be releasably moved toward the adapter to install or remove the adapter from the panel board thereby allowing the socket to be wired prior to the time it is mounted in the panel board.

3,651,447

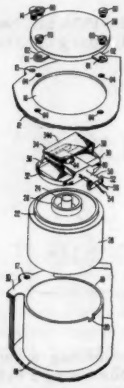
ELECTRIC DEVICE AND COAXIAL CONNECTION

Richard P. Branco, Bridgeport; Edgar O. Sprude, Philadelphia, and Albert W. Diener, Willow Grove, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 29, 1970, Ser. No. 50,733

Int. Cl. H01r *13/58, 17/06*

U.S. Cl. 339—102 R **6 Claims**



An electric device and a terminal connection which includes a connector for electrically connecting the device to conductors of a circuit. The terminals of the device are coaxial and located at the same end of the device. The connector has a handle which facilitates disconnecting it and which folds compactly when the electric device and terminal connection are packaged. The connector is so mounted that it retains its orientation whenever it is disconnected from the electric device.

3,651,448

POWER FRAME FOR INTEGRATED CIRCUIT

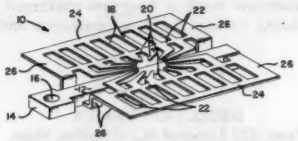
William Vito Pauza, Palmyra, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 20, 1970, Ser. No. 21,348

Int. Cl. H01r *13/00*

U.S. Cl. 339—112 R **4 Claims**

This disclosure relates to power frames for mounting integrated circuits and, more particularly, to a metallic mounting member upon which a semiconductor device may be mounted and connected to form a completed device utilizing



automatic equipment for assembly encapsulation, the mounting member including provision for efficient and rapid dissipation of heat produced in the semiconductor device.

3,651,449

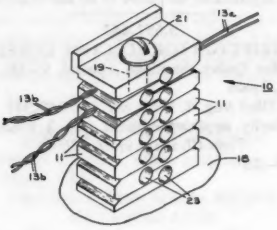
RESILIENT TERMINAL BLOCKS

Frederick W. Hall, and George Poehlmann, both of Indianapolis, Ind., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed June 18, 1969, Ser. No. 834,329

Int. Cl. H01r *7/08*

U.S. Cl. 339—244 R **5 Claims**



A terminal block which in one embodiment comprises a serpentine array of integrally molded plastic clamping members with pre-formed spaces therebetween. In a second embodiment, the terminal block is molded in two units, with a double row array of spaced clamping members in one unit being interleaved with those in the other unit when assembled. Such terminal blocks as a whole, and the clamping members thereof, in particular, are sufficiently resilient so that the latter by spring action facilitate the selective insertion of terminals therebetween, as well as the selective removal of terminals therefrom without adversely affecting any other terminal connections.

3,651,450

RECORDING SYSTEM FOR SEISMIC SIGNALS

Thomas W. Lamb; Robert E. Lee; William C. Montgomery, Jr., all of Houston; William R. Orr, Bellaire, and Charles B. Vogel, Houston, all of Tex., assignors to Shell Oil Company, New York, N.Y.

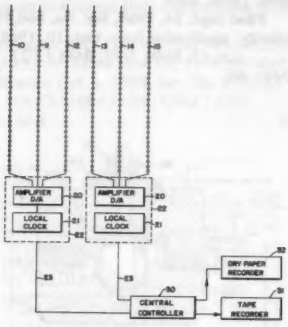
Filed Oct. 20, 1969, Ser. No. 867,523

Int. Cl. G01v *1/28*

U.S. Cl. 340—15.5 **10 Claims**

A recording system adapted to digitally record the data from a large number of geophones wherein the geophones

are divided into subgroups with the data from each subgroup being multiplexed with a local clock signal and transmitted to



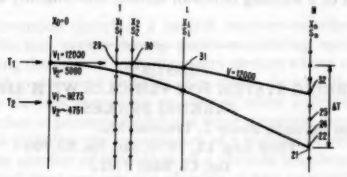
a central recording station where it is partially demultiplexed, stretched in time, and recorded.

3,651,451

CONTINUOUS VELOCITY ESTIMATION

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation

Filed Oct. 23, 1969, Ser. No. 868,784
Int. Cl. G01v *1/00*
U.S. Cl. 340—15.5 11 Claims



In seismic exploration, an index set of travel time curves is specified. This index set of travel curves is used to determine velocity by a signal detection technique. At different values of zero offset time, different velocities are associated with each of the curves. Since the index set of travel time curves is computed only once, for a prescribed velocity time range, considerable computer time is saved.

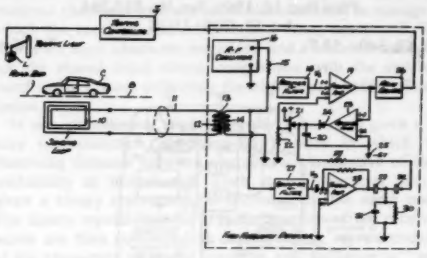
3,651,452

FIXED-FREQUENCY VEHICLE DETECTOR

Milton Friedman, Roslyn, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Apr. 17, 1970, Ser. No. 29,393
Int. Cl. G08g *1/00*
U.S. Cl. 340—38 L 8 Claims

A vehicle detector for sensing the presence of a vehicle and for producing a control signal to activate a traffic controller or other vehicle-responsive system associated with the detector. The detector includes an inductive loop buried in the road bed, the loop being coupled to a fixed-frequency R-F oscillator. An output signal is derived from the loop whose amplitude depends on the impedance thereof, which impedance is subject to a rapid change in value when a vehicle or other metallic mass passes in the vicinity thereof and to slow changes in value as a result of varying environmental conditions. This output signal is compared with a reference signal also derived from the loop, which reference signal has a level unaffected by said rapid change but depends on said



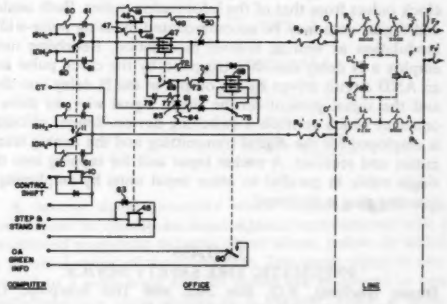
slow changes to produce a control signal which reflects the presence of a vehicle. The control signal serves to activate the associated system.

3,651,453

VEHICLE TRAFFIC CONTROL SYSTEM

Norman A. Bolton, Scottsville, and Klaus H. Frielinghaus, Rochester, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 12, 1970, Ser. No. 18,979
Int. Cl. G08g *1/00*
U.S. Cl. 340—42 11 Claims

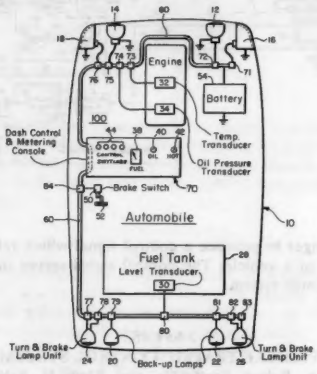


A vehicle traffic control system has been provided having communication means including a pair of line wires and remotely located control apparatus for transmitting control signals to and receiving traffic information from, a local controller over said communications means. The controller operates to provide signals for controlling vehicle traffic in accordance with control signals and also operates to provide signals for controlling the vehicle traffic independently when remote control is terminated. The improvement for communicating controls between the remotely located controller and at least two control devices coupled to said remote controller includes means at the control point for selectively designating a control frequency and auxiliary means coupled to the local station control devices responsive to the initiation of said control frequency for selectively energizing one or the other of said control devices in accordance with the duration of the control frequency.

3,651,454
AUTOMOTIVE MULTIPLEX SYSTEM

Harry J. Venema, Wheat, and Kenneth W. Padgitt, Arlington Heights, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 15, 1969, Ser. No. 885,384
Int. Cl. G08c 15/12
U.S. Cl. 340—52 F 7 Claims

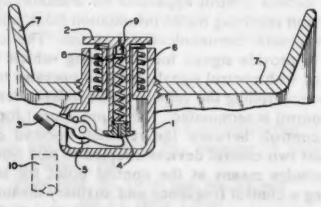


A multiplex system for controlling and sensing various component parts such as head lights, engine temperature, fuel level, and turn signal lights is disclosed. The system employs a single two-wire cable to communicate both power and signals between such components and a central control and metering console which may be the instrument dash console. Time multiplex is employed using a reverse polarity for clock pulses from that of the information pulses. Both analog and digital data may be accommodated by using pulse-width modulation as well as bi-level modulation. Receiving units employ a N delay one-shot triggered by the clock pulse and an AND circuit driven by the output of the N delay one-shot and the signal present on the single signal wire, to drive a one-shot which controls a switching device. Similar circuitry is employed for the digital transmitting and the analog transmitter and receiver. A socket input unit for tapping into the single cable in parallel to other input units by employing a piercing plug is disclosed.

3,651,455
PNEUMATIC TIRE SAFETY DEVICE

Duane Hurlbutt, P.O. Box 302, and Tito Scarponi, 124 Coddington Road, both of Ithaca, N.Y.

Filed Mar. 19, 1969, Ser. No. 808,585
Int. Cl. B60c 23/04
U.S. Cl. 340—58 7 Claims

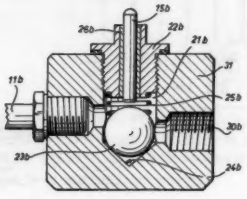


A pneumatic tire safety device that signals an alarm with loss of air pressure and releases air with over inflation.

3,651,456
WARNING DEVICE FOR USE IN VEHICLE HYDRAULIC BRAKE SYSTEM

Philip Sidney Baldwin, Florence, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed Sept. 24, 1969, Ser. No. 860,597
Claims priority, application Italy, Oct. 10, 1968, 53431-A/68
Int. Cl. B60q 1/00; B60t 17/22
U.S. Cl. 340—60 15 Claims

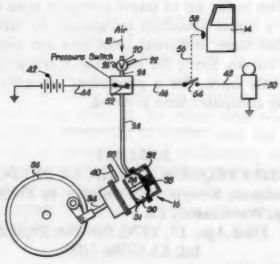


The invention provides a warning device for providing an automatic warning of a fall in braking pressure in an hydraulic brake system. The device is connected in the fluid circuit between the master cylinder and the brake actuators and includes a metal ball which, in normal operation of the brake, rests, for example under spring pressure, against an abutment surface in a chamber formed in the body of the device. Should the pressure in the system downstream of the device fall, the ball is drawn away from this abutment surface by the resulting fluid flow through the chamber and contacts an insulated metal pin in the chamber to complete an energizing circuit of a warning indicator device, conveniently a warning lamp.

3,651,457
WARNING SYSTEM FOR VEHICLES WITH AIR-TYPE PARKING BRAKES

Reuben Sprouse, Route 2, Trenton, Mo.

Filed Aug. 14, 1970, Ser. No. 63,701
Int. Cl. B60t 17/22
U.S. Cl. 340—69 1 Claim



A system for pneumatically sensing failure of a vehicle operator to relieve the pneumatic pressure preventing setting of a spring-set, air-released type parking brake which employs an electric circuit containing an alarm device, a switch responsive to pressure in the pneumatic line to the brake cylinder, and a switch operated by opening the door of the vehicle to activate the warning system as the operator is about to leave the vehicle.

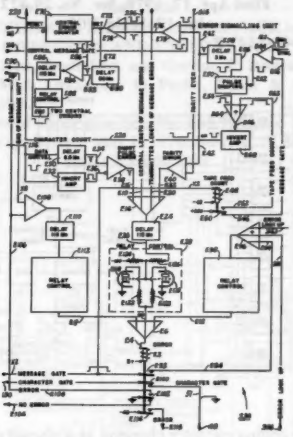
3,651,458
ERROR DETECTION APPARATUS

Andrew C. Reynolds, Jr., Waterbury; John F. Carragan, Woodbury, and George J. Yagusic, Watertown, all of Conn., assignors to Control Data Corporation, Minneapolis, Minn.

Original application Dec. 31, 1959, Ser. No. 863,227, now Patent No. 3,519,139, dated May 12, 1970. Divided and this application Oct. 1, 1969, Ser. No. 870,983

Int. Cl. G08c *25/00;* **G06f** *11/00*

U.S. Cl. 340—146.1 **12 Claims**



This invention describes a central receiver-recorder for a data collection system having parity monitoring means for monitoring the state of multiple binary devices whose outputs are gated to a second plurality of bi-stable devices, the state of those devices recording an output when a preselected combination is present. Additional error detection means are disclosed including the transmission of a number corresponding to the number of characters of a variable length message transmitted from any one of a plurality of data transmitters to a central receiver-recorder, means at the receiver-recorder for counting the number of characters in the variable length message received and means for comparing the counted number with the transmitted number with an error signaling device activated when the numbers do not compare.

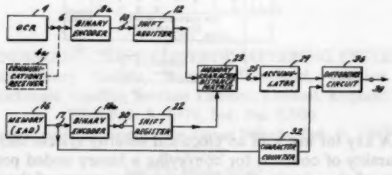
3,651,459
CHARACTER DISTANCE CODING

Peter M. Hahn, Wyndmoor, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed May 15, 1970, Ser. No. 37,580

Int. Cl. G06k *9/08*

U.S. Cl. 340—146.3WD **12 Claims**



A data processing system for improving the performance of information handling systems, such as an automatic letter sorting system, wherein the class of permissible received messages is known in advance.

Received words are compared to stored words, character by character. Each comparison is given a score which is a function of the probability of confusing the particular received character with the particular character in storage to which the received character then is being compared. The scores for each character are added and a match is accepted for the stored word whose comparison with the received word yields a score indicating the highest probability of confusion.

In one embodiment, each received character is given a binary representation according to a code in which the Hamming distance between characters is indicative of their probability of interchange. Each stored character also is given a binary representation according to the same code. The binary representations of the characters of the received words are then compared to corresponding representations of the characters of stored words in an "exclusive or" gate which measures the Hamming distance between corresponding characters by making a bit by bit comparison. The Hamming distances are then added in a digital "adder" to obtain a score for the complete word. The score for the word is then compared in a "difference" circuit to the number of characters in the stored word. A match is accepted for that stored word yielding a score less than the number of characters in the word.

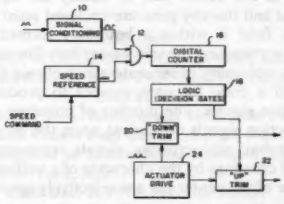
3,651,460
FIXED RATE INTEGRAL CONTROLLER

Edward F. Gebelein, Jr., Harwinton, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed May 21, 1970, Ser. No. 39,431

Int. Cl. F02d *11/10;* **G06f** *7/02*

U.S. Cl. 340—146.2 **7 Claims**



A control signal generator which employs digital logic techniques to classify an input signal commensurate with a monitored parameter as being either above, below, or within a nominal range of the parameter. The input signal is converted to a pulse train and the pulses are employed to gate high-frequency clock pulses to a counter which is interrogated and filled at the same time. Decision gates suitably interconnected with the counter detect when numbers commensurate with the upper and lower limits of the nominal range of the monitored parameter are counted and, depending upon the number loaded into the counter during each pulse commensurate with the input signal, the decision gates will control the generation of steady-state output signals which may be employed to control a mechanism which adjusts the monitored parameter in the proper direction.

3,651,461
CENTER REFERENCED CHARACTER IDENTIFICATION

Arthur W. Holt, Annapolis, Md., assignor to Recognition Equipment Incorporated, Irving, Tex.

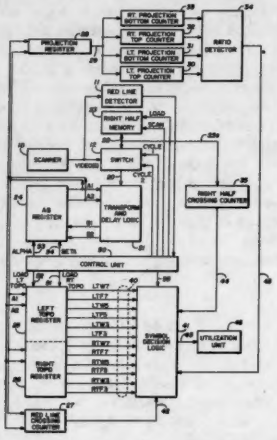
Filed Apr. 17, 1970, Ser. No. 29,485

Int. Cl. G06k *9/10*

U.S. Cl. 340—146.3AC **25 Claims**

Printed characters, superimposed upon a contrasting center bar extending through a character field, are identified

by scanning each character along a plurality of vertically aligned laterally spaced paths to generate character signals dependent upon encountering a character portion. The center bar is sensed to generate a control signal. In response to the character signal and the control signal an output signal is produced. In a preferred mode for alphanumeric characters white signals and black signals representative of white and black fields at each of a plurality of points along each said path are generated. The signal from each given point is compared with signals representing points immediately above, immediately below and next most remote, with



reference to the center bar, to modify the signal from the given point and thereby generate enclosed point signals when any white field is within a boundary formed by a black character portion and the said center bar. The enclosed point signals for a plurality of separate zones of said field are compared with a code for each symbol to produce character identification signals. The number of crossings of the center bar, projection signals dependent upon the projections onto the center bar, and crossing signals representative of the number of crossings by the character of a vertical line spaced to one side of the center bar are selectively employed.

3,651,462

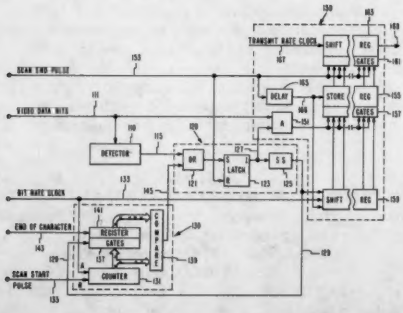
SINGLE SCAN CHARACTER REGISTRATION

Gerald J. Balm, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 20, 1970, Ser. No. 57,381

Int. Cl. G06k *9/04*

U.S. Cl. 340—146.3 H **14 Claims**



An improved method and apparatus are shown for selecting and registering data bits from a single scan line which data bits represent only a portion of an alpha-numeric character. Registration is controlled by the location of the data bits representing the portion of the character from each scan and a registration reference signal determined from the location of data bits from previous scans.

3,651,463

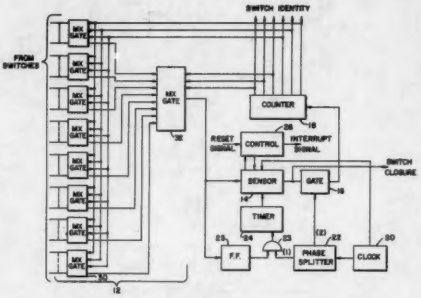
SWITCH CODING CIRCUITRY

Edward B. Rawson, Lincoln, and John B. Dowling, Stow, both of Mass., assignors to Medidata Sciences, Inc., Waltham, Mass.

Filed Apr. 17, 1970, Ser. No. 29,422

Int. Cl. H04q *3/00*

U.S. Cl. 340—147 R **7 Claims**



Switch coding circuitry common to a plurality of mechanically unrelated input switches and operative to provide detection of a valid switch actuation and to provide a digital representation of the identity of an actuated switch.

3,651,464

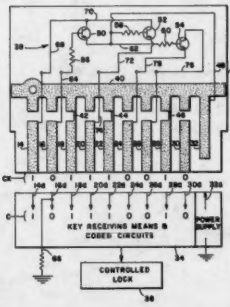
HIGH SECURITY ELECTRICAL KEY

Robert A. Hedin, Yorba Linda, and Robert H. Du Quesnay, Buena Park, both of Calif., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Feb. 22, 1971, Ser. No. 117,271

Int. Cl. H04q *9/00*; **G05b** *1/00*; **H01h** *47/00*

U.S. Cl. 340—149 R **17 Claims**



A key for use with an electrical security system includes a plurality of contacts for conveying a binary coded permutation of electric signals to key receiving means of the system for actuating the system when the key is the proper key, a plurality of conductor paths for interconnecting at least a portion of the plurality of contacts, and control means associated with the conductor paths for controlling the conductivity therethrough. The control means has a first condition

when the key is engaged with the key receiving means and second condition when the contacts are disengaged from the key receiving means. When the control means is in its first condition the contacts convey the predetermined binary coded permutation to the key receiving means so as to actuate the security system and when the control means is in its second condition the contacts are inoperable to convey the predetermined code stored on the key. Accordingly, deciphering of the key by an unauthorized person is prevented when the key is disengaged from the key receiving means and the control means is in its second condition.

3,651,465

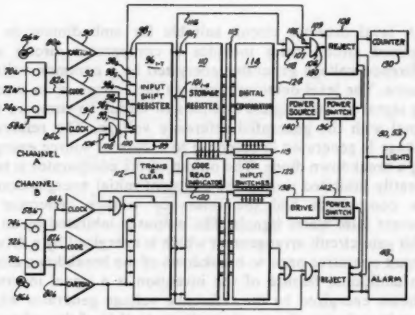
METHOD AND APPARATUS FOR PACKAGE INSPECTION AND VERIFICATION

Kenneth J. Law, Southfield, and Gordon R. Brown, Livonia, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Continuation of application Ser. No. 605,704, Dec. 12, 1966. This application May 1, 1970, Ser. No. 31,850

Int. Cl. H04q 1/00

U.S. Cl. 340—149 R **26 Claims**



By way of information and not by way of limitation, a six bit bar code and six clock bars, one clock bar being paired with each bit, are printed on a carton. The bar code positively identifies the article for which the carton is labeled. During a packaging operation the code is scanned and detected and then compared against a reference code identifying the article being placed in the carton. The arrangement of the code bits or code bars relative to the clock bars and to the scanning sequence is such that a complete code is read bit-by-bit into a digital logic circuit only after enabling of the logic circuit by a clock pulse produced in response to the paired clock bar for each bit. This is done by entering the code into a shift register bit-by-bit with register shifting being under the control of the clock bars. If the code read is not true to the reference code, a reject indication is provided or the carton bearing the incorrect code is automatically rejected from the packaging line.

3,651,466

VENDING MACHINE CONTROL METERING SYSTEM

Harold Henry Galpin, Belmont, England, assignor to Quickmaid Vending Services Limited, London, England

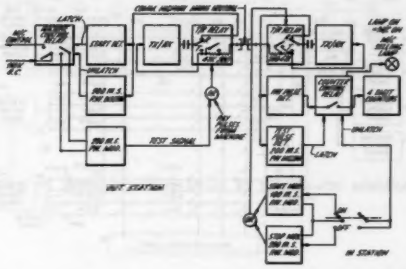
Filed Feb. 5, 1970, Ser. No. 8,800

Claims priority, application Great Britain, Feb. 5, 1969, 6,197/69

Int. Cl. H04q 9/00

U.S. Cl. 340—150 **19 Claims**

Vending and recording apparatus comprising one or more vending machines, a central recording station, signal generator including a radio frequency carrier generator generating a range of radio frequency capable of affording a number of spaced carrier channels of which at least one individual channel is allocated to each of the machines, circuitry for modulating said carrier channels with trains of pay pulses representing cost units indicative of the value of a dispensed



article to obtain, when an article is dispensed from the vending machine modulated carrier radio frequency signals capable of being transmitted over a physical transmission line between said central station and said machine, and at said central station circuitry demodulating and amplifying said carrier frequency signals and recording and indicating a signal output representing the value of the dispensed article.

3,651,467

ELECTRONIC MULTISELECTOR HAVING LARGE AND SMALL GEOMETRY MOS TRANSISTOR CROSSPOINT CONTROL

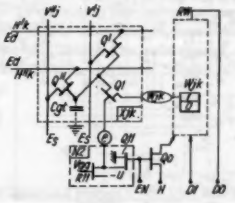
Jacques Henri De Jean, Ris-Orangis; Marc Jean Pierre Leger, Chaville, and Claude Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,839

Claims priority, application France, Sept. 19, 1969, 6944164

Int. Cl. H04q 3/00

U.S. Cl. 340—166 **3 Claims**



A memory unit is provided at each crosspoint of an electronic multiselector. The memory comprises a bistable element and a capacitor which keeps the crosspoint latched while external determinations are made concerning future changes of state of the crosspoint.

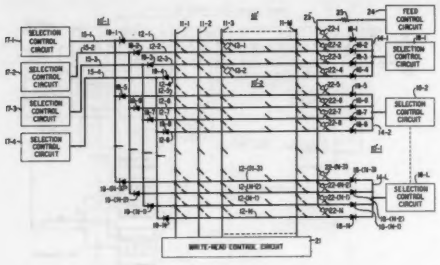
3,651,468
ARRANGEMENTS FOR REDUCING NOISE IN TANDEM MATRIX CIRCUITS

Sigurd Gunther Waaben, Princeton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 83,445, Oct. 23, 1970, now abandoned. This application Dec. 9, 1970, Ser. No. 96,310

Int. Cl. H04q *3/00;* **G11b** *5/00;* **G11c** *7/00*

U.S. Cl. 340—166 R **13 Claims**



An arrangement for decreasing the noise in tandem matrix access circuits which employ diodes to interconnect their primary and secondary sets of matrices. In particular, each rail circuit of the secondary matrix is coupled to its respective pair of rail circuits of the primary matrix by diodes which are oppositely poled with respect to one another. Connection of the rail circuits in this manner permits the nonselected rails of the secondary matrix to be coupled to ground through low impedances during selection of a particular rail of the matrix. As a result, leakage currents appearing in the nonselected rails are shunted to ground, thereby eliminating the noise effects of these currents in the matrix.

In one embodiment of the invention, the two diodes coupled to each rail of the secondary matrix are charge-storage diodes. In another embodiment, one of the diodes is a charge-storage diode whereas the other is a Schottky diode.

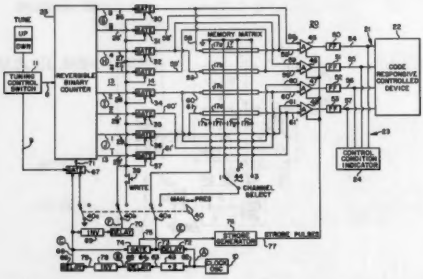
3,651,469
BINARY TOUCH-TUNE SYSTEM WITH MEMORY

David F. Keese, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Mar. 22, 1971, Ser. No. 126,776

Int. Cl. H04b *1/16;* **H04q** *9/00*

U.S. Cl. 340—168 R **14 Claims**



A remote control system employing a binary memory matrix is disclosed. A binary control code word is generated by selective application of clock pulses to a step-controlled code generating means. The memory matrix is employed in conjunction with a control indicator to effect bidirectional incremental control steps of a controlled device. Pre-set word channels of the memory matrix may have written therein readily changeable selected code words for subsequently commanded read-out to control the device to one of a plurality of predetermined controlled conditions.

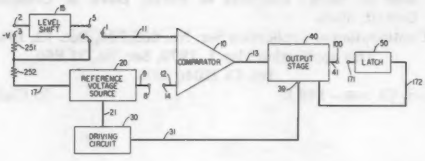
3,651,470
INTEGRATED LEVEL DETECTOR CIRCUIT WITH GATING ARRANGEMENT TO INHIBIT TRANSIENT OUTPUT SIGNALS IN RESPONSE TO ENERGIZATION OF THE CIRCUIT

Robert Joseph Healey, Morris Township, Morris County, and Joseph Plany, Parsippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 8, 1970, Ser. No. 44,159

Int. Cl. H04q *1/00*

U.S. Cl. 340—172 **4 Claims**



A level detector circuit suitable for embodiment in integrated circuit form includes a comparator circuit and reference voltage generator energized by a common voltage source. The level detector monitors the voltage of an incoming signal by utilizing the comparator circuit to compare this signal with the generated reference voltage. The reference voltage is generated in response to a current source energizing a breakdown diode. The output of the comparator is temporarily inhibited during the transient initial energization of the comparator and the reference voltage generator to prevent false alarm signals. The output is inhibited by an inhibit gate circuit arrangement which is energized by a driving circuit operative prior to breakdown of the breakdown diode. An additional feature of the invention is a signal inversion scheme energized by the reference voltage generator which permits voltages of opposite polarity to that of the reference and energization voltages to be compared with the magnitude of the reference voltage by the comparator.

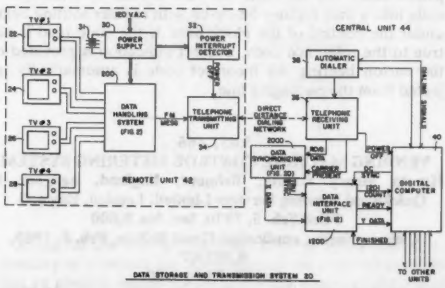
3,651,471
DATA STORAGE AND TRANSMISSION SYSTEM

Donald E. Haselwood, Deerfield, and Carl M. Solar, Glenview, both of Ill., assignors to A. C. Nielsen Company, Chicago, Ill.

Filed Mar. 2, 1970, Ser. No. 15,696

Int. Cl. G06f *9/18*

U.S. Cl. 340—172.5 **25 Claims**



A system for economically monitoring via telephone a large number of remotely located television receivers or the

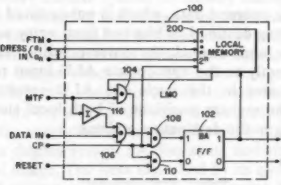
like. Remotely located data handling systems check the status of receiver groups once every 30 seconds. Whenever a change in status is detected, the altered status is recorded as a "change line data set" in a continuously circulating memory which can store 40 such data sets. At periodic intervals a central unit contacts the remotely located data handling system via telephone. The data sets are then repeatedly transmitted to the central unit in the form of a frequency modulated audio tone. With the aid of a marker bit that reverses its sign each time the circulating memory fully circlates, the central unit is able to extract the 40 data sets from the modulated tone and is also able to check for transmission errors.

3,651,472

MULTISTATE FLIP-FLOP ELEMENT INCLUDING A LOCAL MEMORY FOR USE IN CONSTRUCTING A DATA PROCESSING SYSTEM

Thomas O. Holtey, Newton Lower Falls, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 4, 1970, Ser. No. 16,448
Int. Cl. G11c *19/00*
U.S. Cl. 340—172.5 **17 Claims**



A multi storage element for use as a computer system register stage includes a basic storage device and a small bit wide addressable local memory which provides multi storage for the device. Logic circuits interconnect the addressable local memory and basic storage device for either selectively loading or selectively unloading the device of information contents. Additionally, the multi storage element can include an auxiliary storage device which provides an alternate path for either selective loading or selective unloading the contents of the elements basic storage device. The auxiliary storage devices of each element connect in series to form an auxiliary shift register for either readout or alteration of the basic storage device and local memory contents.

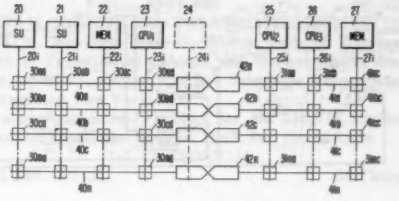
3,651,473

EXPANDABLE INTERLOCK EXCHANGE FOR MULTIPROCESSING SYSTEMS

Ulbe Faber, Honeybrook, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 27, 1970, Ser. No. 23,167
Int. Cl. G06f *15/16, 15/26*
U.S. Cl. 340—172.5 **10 Claims**

This disclosure relates to an expandable interlocking exchange for a multiprocessing system that allows additional processors, memory modules and peripheral devices to be coupled to the exchange without incurring signal degradation and increased noise during data transfer. The exchange is a cross matrix of input-output buses or ports, for each of the accessing units, and interconnecting buses. Expansion is achieved by removing one of the accessing units from the exchange and employing the gates, which coupled that unit to the exchange, to couple the interconnecting buses to a new set of interconnecting buses to service the additional units.

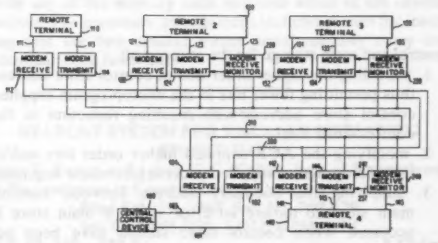


3,651,474

SYNCHRONIZATION SYSTEM WHICH USES THE CARRIER AND BIT TIMING OF AN ADJACENT TERMINAL

Richard A. Liberman, Stratford, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,311
Int. Cl. G06f *3/04*; H04l *7/04*
U.S. Cl. 340—172.5 **6 Claims**



A data communications system including apparatus at each remote location for detecting the carrier phase and bit timing of transmitted data from an adjacent, more remote terminal, to maintain synchronization for subsequent data transmissions from each remote terminal without the need for resynchronizing.

3,651,475

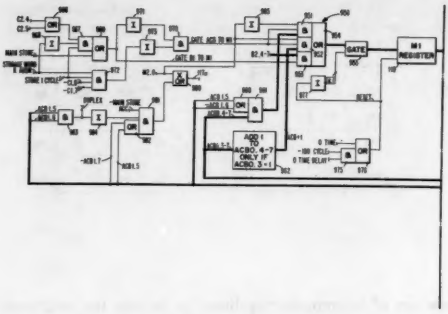
ADDRESS MODIFICATION BY MAIN/CONTROL STORE BOUNDARY REGISTER IN A MICROPROGRAMMED PROCESSOR

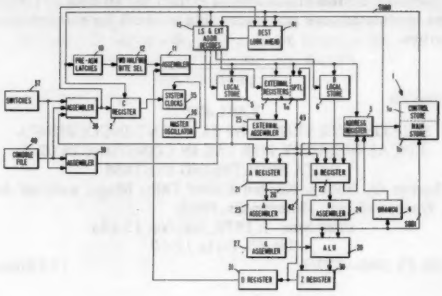
Robert G. Dunbar, Jr., Apalachin, and Karl K. Womack, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

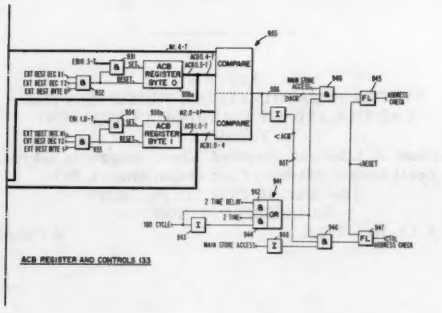
Filed Apr. 16, 1970, Ser. No. 29,226
Int. Cl. G06f *9/20*
U.S. Cl. 340—172.5 **4 Claims**

An address check boundary (ACB) register is initialized in accordance with the total amount of control/main storage

with common addressing and with the relative amounts of operands from the local storage units during read operations for application to ALU input registers. Means are effective early in each cycle for comparing the operand addresses with the destination address of ALU results (if any) from the next preceding cycle. If one of the operand addresses equals the destination address, only that portion (one to four bytes) of







the local store operand data, which is not updated due to the results not being destined, is blocked from entry to the ALU input register; and, instead, the corresponding ALU results are gated directly to the appropriate ALU input register for processing. Later in the cycle the ALU results are also destined to the register positions of both local storage units corresponding to the destination address.

control and main storage for the purpose of:

1. providing the higher order bits of control store address thus permitting fewer bits in the microprogram supplied control store address with resulting reduction in the control word size;
2. modifying the ACB supplied higher order bits and/or the microprogram supplied address bits where required;
3. supplying the boundary address between control/main store to initiate an error signal if main store is accessed when control store should have been accessed and vice versa;
4. providing data regarding the type (internal-external) and amount of main storage and regarding the system type-simplex (one processor) or duplex (two processors).

3,651,477

PROCESSOR WITH IMPROVED CONTROLS FOR SELECTING AN OPERAND FROM A LOCAL STORAGE UNIT, AN ALU OUTPUT REGISTER OR BOTH

Thomas A. Metz, and Karl K. Womack, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1970, Ser. No. 29,227

Int. Cl. G06f 7/38

U.S. Cl. 340—172.5 **5 Claims**

In a high performance microprogrammed processor, ALU results obtained during one microprogram cycle are destined to a pair of high speed local storage units during the next succeeding cycle. During each write operation, identical data is stored in corresponding register positions of each local storage unit. This permits simultaneous accessing of any two

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3,651,477

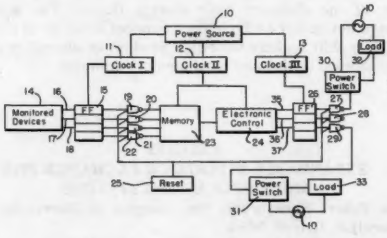
PROCESS CONTROL SYSTEM

Peter G. Bartlett, and Donald E. Henry, both of Davenport, Iowa, assignors to Struthers-Dunn, Inc., Pitman, N.J.

Filed June 18, 1970, Ser. No. 47,328

Int. Cl. G06f 1/04, 15/46

U.S. Cl. 340—172.5 **10 Claims**



The present invention provides a process control system which minimizes the effect of noise on the system and also minimizes the amount of noise produced by the system. This is accomplished by properly timing all operations, both sensing and control, so as to both minimize the possibility of a spurious signal caused by noise and also minimize the amount of noise produced by the system in its operation. The sensing function is timed to occur when the power source

voltage is at a maximum. When the power source voltage goes through zero the control operations, i.e., switching or relays, etc., is effected. After completion of the sensing function, but prior to the control operations, the indications previously sensed are stored in a high-speed memory and the process control decision making apparatus is enabled.

3,651,478

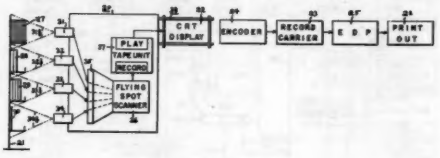
INVENTORY CONTROL SYSTEM

John J. Shandlay, 489 Robbins Ave., Philadelphia, Pa.

Filed July 7, 1970, Ser. No. 52,948

Int. Cl. G01d *5/12, 5/39*

U.S. Cl. 340—172.5 **20 Claims**



An inventory control system for rapidly taking an inventory of items in an array including an optical scanning system which provides an image of variable size of each item in accordance with the number of units of the item in the inventory, a larger image denoting more units, a signal generator which converts the image to a train of electrical signals, a storage device for storing the signals for later use, retrieval apparatus for regenerating the stored signals at a subsequent time, and a display system for displaying and size quantizing the original image. The item identified by its quantized image is checked against a data bank to determine for that item how many units correspond to the particular image size displayed. The checking may be automatic or manual, and an automatic print-out may be provided if desired.

3,651,479

APPARATUS FOR DETERMINING THE DIRECTION OF PROPAGATION OF A PLANE WAVE

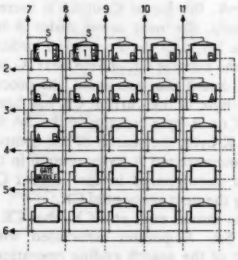
Andre Simon Georges Lambert, Fresnes, France, assignor to Societe Alsacienne de Constructions Atomiques de Telecommunications et d'Electronique "Alcatel", Paris, France

Filed June 18, 1970, Ser. No. 47,472

Claims priority, application France, June 18, 1969, 6920412

Int. Cl. G01s *3/00*

U.S. Cl. 340—172.5 **11 Claims**



A switching system used in a system for determining the direction of propagation of a plane wave. The switching system comprises a matrix wherein each module connects a detector to an aggregation circuit according to predetermined coded data corresponding to predetermined wave directions.

3,651,480

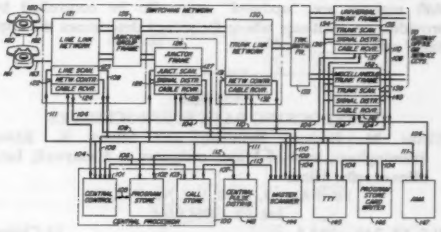
PROGRAM CONTROLLED DATA PROCESSING SYSTEM

Randall W. Downing; John S. Nowak, both of Wheaton; Frank F. Taylor, West Chicago, and Werner Ulrich, Glen Ellyn, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Original application Dec. 31, 1963, Ser. No. 334,875. Divided and this application Nov. 24, 1967, Ser. No. 685,636

Int. Cl. G06f *15/16*

U.S. Cl. 340—172.5 **55 Claims**



A program controlled data processor system which employs functionally equivalent first and second control units on a mutually exclusive basis to control an input-output system. The processor system comprises a plurality of independent memory units and communication between the control means and the independent memory units is by way of communication paths which may be selectively associated with any of the memory units and with either of the control means. The processor arrangement includes means for insuring that the two control means simultaneously carry out identical work functions.

3,651,481

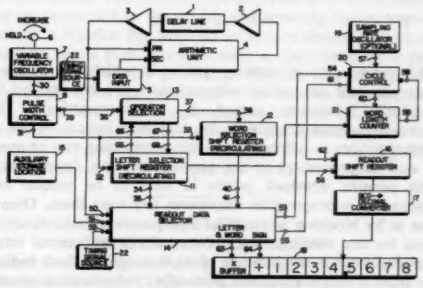
READOUT SYSTEM FOR VISUALLY DISPLAYING STORED DATA

John T. Evans, and Leroy U. C. Kelling, both of Waynesboro, Va., assignors to General Electric Company

Filed Feb. 29, 1968, Ser. No. 709,429

Int. Cl. G06f *7/30, 13/02;* **G06h** *3/14*

U.S. Cl. 340—172.5 **5 Claims**



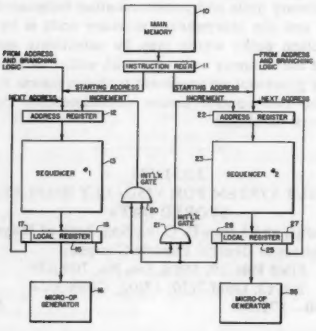
A system for visually displaying interlaced data stored in a recirculating delay line. The stored data is in six functions,

each function comprising three eight digit words. Data within each function is interlaced by presenting the least significant digit of all three words, followed by the next to least significant digit of all three words and so on. The data display may be single selected words or may comprise display of particular words in predetermined sequence. Sequential display of all three words in selected functions is accomplished by providing a three bit recirculating shift register. The sequencing rate is controlled by a variable frequency oscillator. It is also possible to sequentially select the data associated with each letter address. This is accomplished by way of a second recirculating shift register whose sequencing rate is also controlled by the variable frequency oscillator. As the data is selected, it is fed into a third shift register where it is stored in binary coded decimal. A BCD to decimal converter converts the contents of the third shift register to decimal format. THe output of the BCD to decimal converter feeds the display device. The rate at which the contents of the third shift register are "updated" may also be controlled by providing an oscillator whose frequency determines the "update" rate.

3,651,482
INTERLOCKING DATA SUBPROCESSORS

Victor M. Benson, Belmont, and Stuart K. Klein, Framingham, both of Mass., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 3, 1968, Ser. No. 718,493
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **11 Claims**

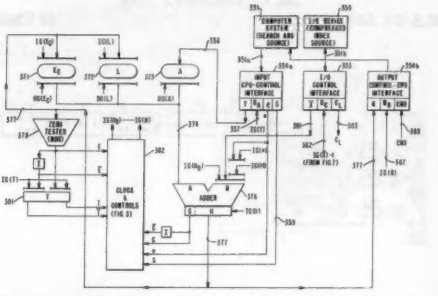


Electronic data processing systems in which two or more microprogram controlled subprocessors are interlocked by interlock indicators placed in microinstructions. The microinstructions containing the interlock indicators are at critical sequence points in operations requiring two or more of said subprocessors to act concurrently and dependently. This permits interlock points in time to be unique and tailored to microprogram sequences requiring them. Operation is by blocking advance of a sequence of microinstructions for one subprocessor upon receiving an internal interlock indicator in the absence of an external interlock indicator from a microinstruction of another subprocessor operating interdependently therewith. The microprogram control and interlocks permit the subprocessors to proceed independent of the commencing instruction thus facilitating instruction look ahead.

3,651,483
METHOD AND MEANS FOR SEARCHING A COMPRESSED INDEX

William A. Clark, IV, Poughkeepsie, N.Y.; Kent A. Salmond, Los Gatos, Calif., and Thomas S. Stafford, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1969, Ser. No. 788,835
Int. Cl. G06f 7/10
U.S. Cl. 340—172.5 **52 Claims**



Electronically searching a Compressed Index for a representation of a search argument (SA). The index comprises a sequence of compressed keys (CK's) generated with the method in patent application Ser. No. 788,807, in which the sequence of compressed keys represents a sorted sequence of uncompressed keys, and each compressed key (CK) has the FLK format as defined therein. As ascending sorted index is assumed for the described embodiments. An Equal Counter is used during the search to represent which byte (called A-byte) of the SA is being searched for. The A bytes are handled one byte at a time beginning with the highest order byte in the SA. The counter is initially set to reflect this beginning and it is incremented each time the A-byte compares equal with one of the key bytes (called K byte) in a current CK being searched.

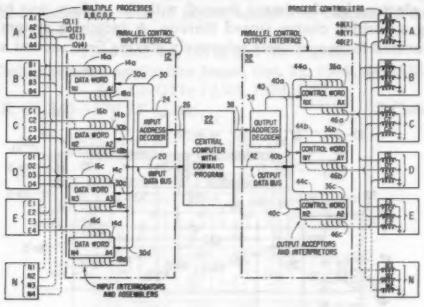
Electronic means compares the Equal-Counter setting, E_c, with a factor-byte count, F, the latter being obtained from the F field in a CK. If E_c is greater than F, the search is completed. If E_c is less than F, the search continues using the next sequential CK in the compressed index. But, if E_c is equal to F, the highest order K-byte in the current CK is compared against the current A-byte. If K<A, the search also continues using the next sequential CK. But if K>A, the search of the compressed index ends with the current CK. However, if K=A, the Equal Counter is incremented as indicated previously, the next lower order A-byte being obtained from the SA, and the next lower order K-byte being obtained from the current CK. These next A- and K-bytes are then compared; and if they are equal, the process is repeated until the last K-byte in the current CK has been found equal to an A-byte. If no A-byte remains in the SA for comparison to a remaining K-byte, the search of the compressed index is completed. If uncompared A-bytes remain in the SA, and no K-bytes remain uncompared in the current CK, the search continues using the next sequential CK.

Whenever the search ends at a CK, that CK is expected to represent the SA. A pointer associated with that CK is readout as part of the search ending operation. A data item addressed by that pointer is obtained, and the SA is verified against the data item to assure that the SA also represents the retrieved data item.

3,651,484
MULTIPLE PROCESS CONTROL SYSTEM

George R. Smeallie, Mentor, Ohio, assignor to Bailey Meter Company

Filed Aug. 12, 1969, Ser. No. 849,936
Int. Cl. G06f 3/05, 9/00; G05b 15/00
U.S. Cl. 340—172.5 8 Claims

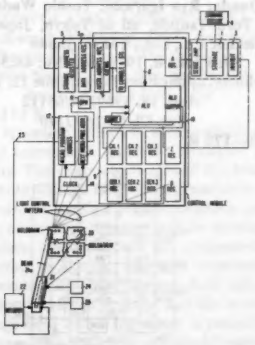


In a process control system employing a digital computer, an apparatus for and method of simultaneously controlling a plurality of processes. A parallel control input interface interrogates a set of output variables from each process and forms a plurality of data words which are addressed for display to the digital computer. The computer develops control words from the data words by the execution of a command program and addresses a parallel control output interface. The parallel control output interface accepts the control words from the digital computer and interprets the control words to simultaneously control the plurality of processes.

3,651,485
HOLOGRAPHIC DATA PROCESSING SYSTEM

James A. McDonnell, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1969, Ser. No. 866,979
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 9 Claims

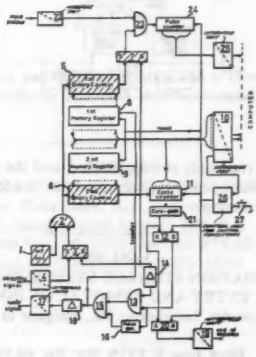


Large scale integration techniques are combined with holographic techniques to provide a highly compact data processing system of extreme high speeds of operation. A single integrated circuit control module containing light responsive devices is selectively actuated by different patterns of light beams generated by appropriate holograms each selected from a single holoarray to provide all of the arithmetic and logic functions of a data processing system.

3,651,486
TIME INTERVAL GENERATING APPARATUS

Sixten Abrahamsson, Sodermalmsgatan 31, 43139 Molndal, Sweden

Filed Nov. 6, 1969, Ser. No. 874,665
Claims priority, application Sweden, Nov. 6, 1968, 15053/68
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 5 Claims



An apparatus is disclosed to be used in conjunction with a suitable general purpose digital computer in programmed time-of-flight mass spectrometric measurements to provide well defined aperture signals with an adjustable time delay from an initiating pulse, adjustable repetition times and adjustable pulse length. A high-frequency generator, e.g., a 100 megacycles/second generator, is used as a clock pulse generator. Two subtract-1-counters are used for time determination. The computer supplies the counters with a first and second numerical quantity, designating the time delay from the initiating pulse, and the sum of the time delay and the pulse length respectively, in terms of the number of pulses from the pulse generator required to measure out the respective time spans. The counters are provided with zero-content outputs connected to the setting and resetting inputs respectively of a bistable flip-flop. At an instant determined by an initiating signal both counters start a countdown at a rate determined by the HF-generator. The flip-flop changes its output state when the first counter has become emptied, i.e., after a time interval corresponding to the desired delay, and returns to its initial output state when the second counter has become emptied. Thus the output from the flip-flop represents the desired time aperture signal.

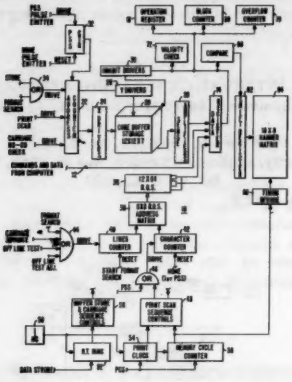
3,651,487
PRINTER CONTROL SYSTEM

Richard S. Washington, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,528
Int. Cl. G11c 9/00
U.S. Cl. 340—172.5 11 Claims

A printer utilizes a core storage print buffer for characters to be printed, and a read only storage device for document

carriage or format control and type chain character reference. The carriage control and type chain character portions of the read only storage device, and the print buffer all have a common data register used for readout to print or operate the carriage.

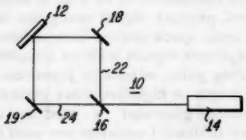


3,651,488

INFORMATION STORAGE SYSTEM EMPLOYING OPTICAL ENTRY AND REMOVAL OF INFORMATION

Juan Jose Amodei, Langhorne, Pa., assignor to RCA Corporation

Filed June 8, 1970, Ser. No. 44,195
Int. Cl. G11c *11/22, 11/42*
U.S. Cl. 340—173 CC **10 Claims**



An information storage system including a storage medium comprising a first material characterized by a change in its index of refraction under the influence of an electric field and a different second material characterized by the inducibility of an electric field therein by optical means. The storage medium can be an admixture of two different materials that respectively exhibit these characteristics. Alternatively, the storage medium comprises a plurality of interleaved layers, alternate ones of these layers comprising material exhibiting one of these characteristics and the other layers comprising material exhibiting the second type of characteristic.

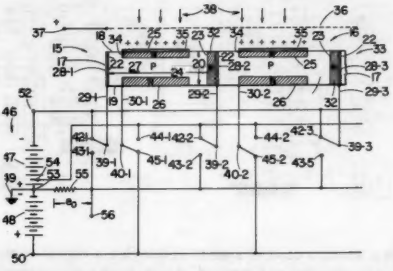
3,651,489

SECONDARY EMISSION FIELD EFFECT CHARGE STORAGE SYSTEM

Robert C. Beutel, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 22, 1970, Ser. No. 5,024
Int. Cl. G11c *11/40, 5/02*
U.S. Cl. 340—173 CR **21 Claims**

A secondary emission field effect charge storage system utilizing a combined NPN and P-channel field effect transistor device. The device includes a body of P-type semiconductor material and a pair of bodies of N-type semiconductor material respectively forming PN junctions with opposite sides of the P-type body in a first dimension thereby forming the NPN transistor, the P and N-type bodies forming the P-channel field effect transistor in a second dimension generally perpendicular to the first dimension. One of the N-type bodies has an outer surface having secondary emissive properties, and a collector electrode is provided for collecting secondary electrons emitted from that surface in response to electron bombardment thereof, with the surface thus having a positive charge stored thereon. A switching system is provided for respectively selectively making first, second and third electrical connections of the other of the pair of N-type bodies and the opposite ends of the P-channel transistor to predetermined potentials. The potentials are applied in the first connection to bias both the NPN transistor and the P-transistor to cut-off thereby to permit charge storage on the surface of the one N-type body. The potentials are applied in the second connection to bias the NPN transistor to cut-off and the P-channel transistor to below cut-off thereby to permit current flow in the P-channel, as modulated by the charge on the surface of the one N-type body to provide a read-out signal. The potentials are applied in the third connection to bias the NPN transistor into conduction and to bias the P-channel transistor to cut-off thereby to neutralize or erase the charge on the surface of the one N-type body.

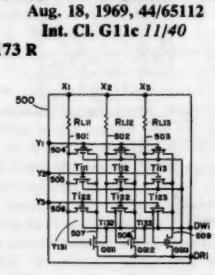


3,651,490

THREE DIMENSIONAL MEMORY UTILIZING SEMICONDUCTOR MEMORY DEVICES

Katsuhiro Onoda; Ryo Igarashi; Toshio Wada; Sho Nakanuma, and Toru Tsujide, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed June 8, 1970, Ser. No. 44,358
Claims priority, application Japan, June 12, 1969, 44/46580; Aug. 18, 1969, 44/65112
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **14 Claims**



A three-dimensional memory includes MIS-type transistors as the memory elements formed on a plurality of integrated matrix boards. The transistor includes an insulating film

capable of storing an electric charge in response to the application of a voltage across the gate and substrate exceeding a critical value. The row and column drive lines are respectively connected to row and column select circuitry, and a third select circuit applies a select voltage to one of the matrix boards.

3,651,491

MEMORY DEVICE HAVING COMMON READ/WRITE TERMINALS

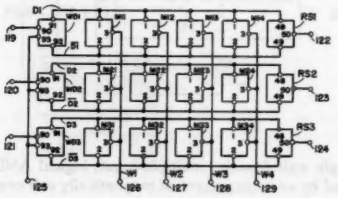
Akira Kobayashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1970, Ser. No. 82,988

Claims priority, application Japan, Oct. 25, 1969, 44/85355

Int. Cl. G11c *11/40, 7/00, 5/02*

U.S. Cl. 340—174 FF **7 Claims**



A memory device, such as for use in a digital computer or the like, comprises a plurality of memory circuits arranged in a plurality of intersecting rows and columns to thereby form a memory matrix. Each of the memory circuits has common read-write terminals respectively connected to a pair of digit signal lines and a terminal for receiving a selection pulse. A memory section of the memory read-out circuit is coupled to each pair of digit signal lines. During a write operation one of the pair of digit lines has a write pulse produced thereon. The section stores information as to which of the digit lines the write pulse was applied until the write pulse has decreased to a negligible level. The output on the other digit signal line, that is, the digit line having no write pulse thereon, controls the production of a read-out signal at the memory output, As a result, a read-out operation may be performed on the memory immediately following a write operation.

3,651,492

NONVOLATILE MEMORY CELL

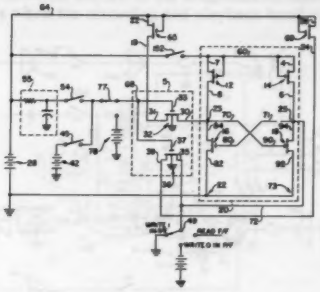
George C. Lockwood, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Nov. 2, 1970, Ser. No. 86,191

Int. Cl. G11c *11/40, 5/02*

U.S. Cl. 340—173 R **11 Claims**

The present invention relates to a nonvolatile memory cell comprising two nonvolatile alterable threshold voltage field effect transistors. The drain electrodes of the two nonvolatile alterable threshold voltage field effect transistors are coupled through load transistors to a common negative power supply. Their gates are connected together and to an external source of negative pulses. Their sources are connected to circuits sensitive to current in the two alterable transistors. The first nonvolatile alterable threshold voltage field effect transistor is placed at a first threshold voltage, and the second alterable threshold voltage field effect transistor is placed at a second threshold voltage. The different threshold voltages set the nonvolatile memory cell in a one state or in a zero state. A current will first pass through the alterable threshold voltage field effect transistor having the less negative threshold voltage, before it passes through the alterable threshold field effect transistor having the more negative threshold voltage during the application of a negatively increasing gate voltage to both alterable threshold voltage field effect transistors.



The state of the nonvolatile memory cell is thus determined by which nonvolatile alterable threshold voltage transistor conducts first.

3,651,493

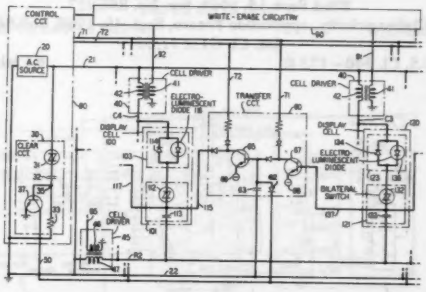
SOLID STATE TRAVELING DISPLAY CIRCUIT

Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1969, Ser. No. 878,401

Int. Cl. G09b *13/00;* **H05b** *39/00*

U.S. Cl. 340—173 R **13 Claims**



A plurality of solid state display cells, individually including a light-emitting element and a memory element, are connected in tandem via transfer circuitry to provide a traveling display image. The transfer circuitry interconnects the memory elements of adjacent display cells and operates in conjunction with an AC bias voltage applied in common to the display cells for moving the display image through successive display cells.

3,651,494

FERROELECTRIC SYNCHRONIZING AND INTEGRATING APPARATUS

Frederick W. Lynch, and Gerald F. Simons, both of Phoenix, Ariz., assignors to Sperry Rand Corporation

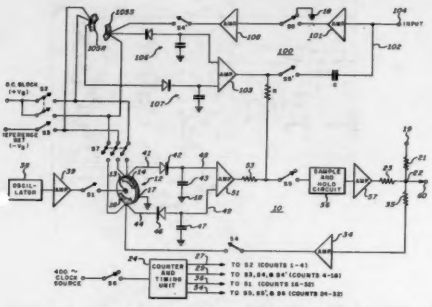
Filed Mar. 27, 1970, Ser. No. 23,131

Int. Cl. G11c *11/22*

U.S. Cl. 340—173.2 **18 Claims**

Solid state synchronizing and integrating apparatus including a ferroelectric member having a permanently polarized motor section and a plurality of variably polarizable generator sections providing output signals in accordance with their

instantaneous polarization in response to an excitation signal applied to the motor. Two generators are utilized in each integrator or synchronizer, one for storing and reading out signal information and the other functioning as a reference



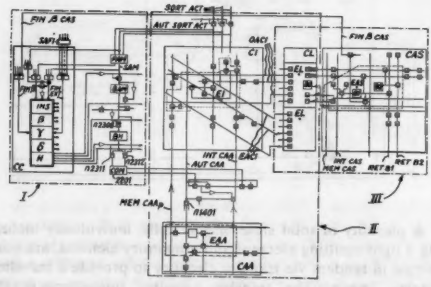
with which the signal information is compared. Switching and timing circuits are incorporated to provide for periodic updating of the stored signal information and allocation of discrete timing intervals for signal storage and read out.

3,651,495

ACTIVE MEMORY

Jacques Louis Sauvan, Paris, France, assignor to Societe Anonyme dite: Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, S.N.E.C. M.A., Paris, France

Filed Sept. 15, 1969, Ser. No. 858,027
Claims priority, application France, Sept. 19, 1968, 166.845
Int. Cl. G11c *11/00*
U.S. Cl. 340—173 R **8 Claims**



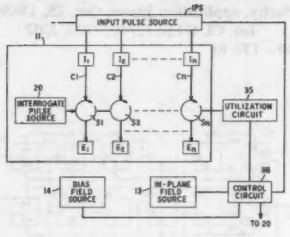
An active memory for use in data processing apparatus for storing information data relating to a system defined by several parameters, each capable of taking a finite number of values, called situations. Each of these situations may be changed in value by a finite number of variations, called actions. For each parameter, a recording center is provided consisting of a matrix having two dimensions, one of which is allocated to the situations (i.e., the values of the parameters) and the other to the actions (that is, the change in value of the parameters). The parameters together are joined by at least one center of Association of Situations or a Center of Association of Actions. These centers are formed of matrices having storage elements the inputs of which correspond to the situations or to the actions, respectively, to be joined. Upon interrogation of the memory, an output will be provided indicating the shortest path (if a path exists) between an initial and a final situation—that is, the memory will supply the shortest transformation making such a connection possible.

3,651,496

MAGNETIC DOMAIN MULTIPLE INPUT AND CIRCUIT

Irynej Danylchuk, Morris Plains, and Paul Charles Michaelis, Watchung, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,072
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF **8 Claims**



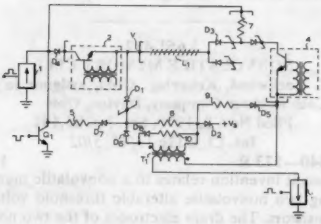
A single wall domain, multiple-input, logical AND circuit is defined by an arrangement of magnetically soft overlay elements adjacent a sheet of material in which the domains can be moved. A plurality of propagation channels defined by the overlay elements include an orthogonal channel which comprises positions where domains are merely recirculated. When interrogated, the orthogonal channel provides an output only when all the idler positions are occupied.

3,651,497

DYNAMICALLY TERMINATED MEMORY LINE SELECTION SCHEME

William M. Cook, Westminster, Calif., assignor to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.

Filed June 29, 1970, Ser. No. 50,366
Int. Cl. G11c *7/00, 11/06*
U.S. Cl. 340—174 LA **25 Claims**



A drive system for a magnetic core memory is disclosed using a pulsed current source to charge a selected group of lines common at one (sink) end and simultaneously raising the bias on the other open (drive) end. When the group has been charged sufficiently to forward bias a diode connected to a supply voltage V_S, a termination resistor having a resistance approximately equal to the characteristic impedance of all lines common at the sink end, suppresses reflections and ringing. The output of the sink current source is connected to an isolating diode at the drive end of each line by a resistor, whereby the bias across the diode remains substantially constant as the lines are charged. A drive current

source is selectively connected to one line of the selected (sink) group. A coupling diode in series with a resistor connected to a source of bias potential terminates the drive end of the selected line during the drive current rise time. When the sink current source is turned off after a memory cycle, a shunt switch is turned on to allow the selected group of lines to discharge to a level of approximately zero volts with respect to circuit ground. Two corresponding, but complementary sets of components are provided for read and write cycles with one shunt switch on during any given cycle to reduce voltage stresses on selection elements.

3,651,498

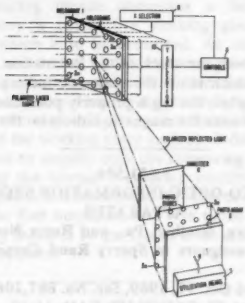
HOLOGRAPHIC STORAGE AND RETRIEVAL SYSTEM

Peter J. Magill, Endwell; Robert E. McCurry, Vestal, and Charles A. Speicher, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,542

Int. Cl. G11c *11/14*

U.S. Cl. 340—174.1 M **6 Claims**



Random selection of holograms from an array comprised of a plurality of holograms is achieved by light reflections from the selected holograms upon illuminating the entire array with a broad beam of coherent light. The array of discrete holograms is overlaid with a reflective magnetizable film, normally uniaxially oriented. When the magnetization vector in the film is rotated in any one or more of the discrete hologram areas, a proportional rotation in the plane of polarization of the reflected light will occur and be directed to a readout diode array. Disposed in the path of the reflected light is an analyzer which is set for maximum extinction when no readout is desired and minimum extinction when a readout is desired, the diode array providing electrical readout signals corresponding to the information read out from the selected hologram.

3,651,499

RECORDER WITH CIRCULAR STORAGE ELEMENT

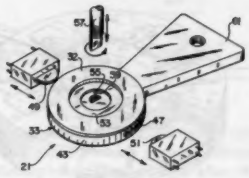
John F. Hynes, Jr., 12356 Creekhaven, St. Louis, Mo.

Filed Jan. 29, 1970, Ser. No. 6,745

Int. Cl. G11b *5/00*; G18b *5/78*

U.S. Cl. 340—174.1 R **12 Claims**

Information storage apparatus utilized as a credit instrument for use in a credit system having point-of-sale terminals in places of business, the terminals each having magnetic recording and playback head means. The credit instrument includes a single circular rotatable element having magnetizable material concentrically secured thereto which is adapted to have encoded credit information magnetically recorded on its surface. An enclosure closely confines the element for rotation and has at least one aperture permitting the recording and playback head means to be placed in close proximity to the surface. The size of the instrument permits it to be conveniently grasped between one's fingers. Means, such as a spindle-receiving arrangement, is cooperative with any of the point-of-sale terminals for causing rotation of the element to move the surface of the magnetizable material by the aperture when the recording and playback head means is



placed in close proximity to the surface, permitting credit information to be recorded on the surface of the magnetizable material and to be read therefrom by the recording and playback head means for use in consummating credit transactions.

3,651,500

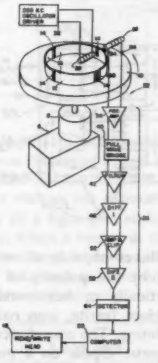
METHOD AND APPARATUS FOR DETECTING THE POSITION OF MOVING PARTS

Richard D. Weir, San Jose, Calif., assignor to Iomec, Incorporated, Santa Clara, Calif.

Filed Apr. 6, 1970, Ser. No. 25,764

Int. Cl. G11b *5/00*

U.S. Cl. 340—174.1 A **7 Claims**

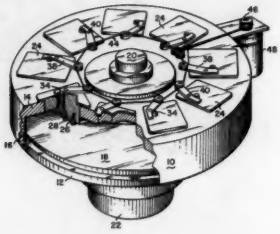


An axially extending annular metal ring having a plurality of spaced slots is attached to a rotating disk. A driven magnetic inductor is placed on one side of the ring and a pick-up inductor is placed on the other side of the ring and opposite the driven inductor for the emission of output signals each time one of the slots comes into alignment with the two inductors. The output signals are transformed into digital pulses which coincide with the alignment of the center of the slot with the two inductors. The pulses, together with a reference or index signal that is generated during each revolution of the ring, are used to determine the relative position of the rotating member.

3,651,501
TRANSDUCER HEAD ACTUATOR FOR MAGNETIC DISC MEMORY

Martin J. Cote, Burbank, Calif., assignor to The Singer Company

Filed Aug. 31, 1970, Ser. No. 68,286
Int. Cl. G11b 5/54, 21/12, 5/60
U.S. Cl. 340—174.1 F 4 Claims

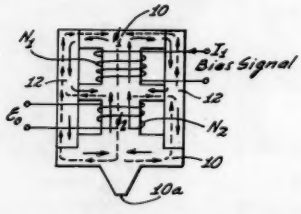


A system for urging a normally retracted magnetic read/write head into working relationship with a magnetic memory disc. The retracting force of a head supporting leaf spring is overcome by a simple system of levers actuated by the tightening of a cable connected with a plurality of other lever systems around the disc. The cable is looped around the capstan on a motor shaft so that the motor, when driven to its stalled condition, will tighten the cable.

3,651,502
MAGNETIC SENSING TRANSDUCER WITH A FLAT UNITARY LAMINATE CORE STRUCTURE

James D. Flora, North Hollywood, Calif., assignor to The Singer Company

Filed June 15, 1970, Ser. No. 46,356
Int. Cl. G11b 5/16, 5/22
U.S. Cl. 340—174.1 F 2 Claims



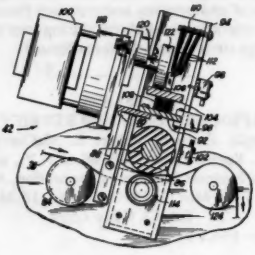
A magnetic transducer capable of sensing binary digital data as represented by the polarity of a magnetic dipole recorded either vertically or horizontally on a magnetic medium such as barium ferrite, iron oxide, or appropriate thin film magnetic plating. The transducer can determine the polarity of the magnetic dipole on a moving or stationary magnetic medium, and it is suitable for use in high density easily programmed magnetic encoders.

3,651,503
SYSTEM FOR PROCESSING MERCHANDIZING TAGS HAVING PRINTED AND MAGNETIC INFORMATION THEREON

Harry W. Kono, Lido Beach, L. I., N.Y., assignor to Tag-A-Tron, Inc., New York, N.Y.

Filed July 22, 1969, Ser. No. 843,454
Int. Cl. B41j 45/00
U.S. Cl. 340—174.1 5 Claims

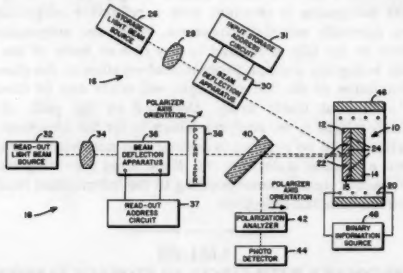
A system for processing merchandizing tags cut from stock having a magnetizable portion and a portion for receiving visible printed information. The stock is carried through a magnetic recording station and a printing station where indicia are respectively magnetically and visually recorded on the stock on each of the portions corresponding to tags which are cut from the stock at the last station. A reader is also provided which reads the magnetic indicia on a tag by being actuated when the tag is properly positioned to move a magnetic reader over the magnetic indicia on the tag.



3,651,504
MAGNETO-OPTIC INFORMATION STORAGE APPARATUS

Norman Goldberg, Dresher, Pa., and Roger Newman, Wayland, Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,206
Int. Cl. G11c 11/42; G11b 11/10
U.S. Cl. 340—174.1 M 4 Claims

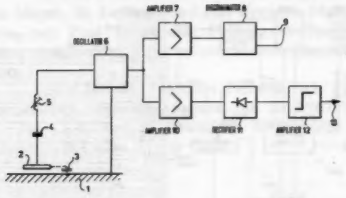


A magneto-optic information storage apparatus in which the memory is a wafer of a ferrimagnetic material having a heat-radiating, light-reflecting metallic sheet secured thereto. Following the storage of a bit of binary information at a selected region of the wafer, by simultaneously raising the temperature of the region above the magnetic compensation temperature of the material and exposing the wafer to a magnetic field, the metallic sheet restores quickly the temperature of the region to the compensation temperature. Read-out of information stored at a region of the wafer is enhanced by reflection of the read-out light beam by the metallic sheet whereby the beam makes two excursions through the region.

3,651,505
CAPACITIVE DISTANCE MEASURING

Claus Schmidt, Sandweier near Baden-Baden, Germany, assignor to Margit Schmall nee Mutscher, Baden-Baden, Germany

Filed Feb. 20, 1970, Ser. No. 13,139
Claims priority, application Germany, Mar. 24, 1969, P 19 14 876.6
Int. Cl. G08c 19/16
U.S. Cl. 340—200 6 Claims

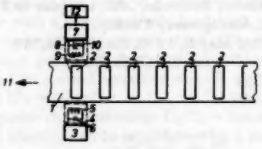


The measuring device comprises a feeling electrode disposed above a conductive working piece surface the distance of which is to be measured. An oscillator is controlled by a series tank circuit that comprises a series connected feeling electrode and an inductance and, in addition, a separating condenser having substantially greater capacity than that of the measuring capacitor formed by the feeling electrode and the working piece surface. A first selective amplifier is tuned to amplify only the measuring frequency that results during the normal measuring conditions. A second selective amplifier is connected to the output of the oscillator parallel to the first amplifier, and it is tuned to amplify the low frequency that will be generated if the measuring capacitor is short-circuited.

3,651,506
CONVEYOR BAND MONITORING APPARATUS

Jorn Olaf, Essen, and Walter Ratz, Gelsenkirchen, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Sept. 30, 1969, Ser. No. 862,253
Int. Cl. G08b 21/00
U.S. Cl. 340—259 9 Claims



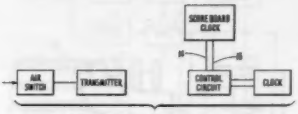
Conductive loops uniformly spaced along the conveyor band complete the signal transmission path between a high frequency transmitter and receiver at uniformly spaced time instants. Damage of conveyor band damages loop, interrupting signal path and consequent interruption of signal from receiver causes stopping of band.

3,651,507
REMOTE CONTROLLING DEVICE

John F. Abbott, 416 Grove Street, Melrose, Mass.

Filed Aug. 20, 1969, Ser. No. 855,453
Int. Cl. G08b 27/00
U.S. Cl. 340—323 10 Claims

A remote controlling device including a control circuit which drives external apparatus, as for example a clock. The circuit is operated remotely by a portable transmitting circuit which generates an electrical signal in response to an input stimulus. The input stimulus may be supplied by an air switch with an air tube connected thereto, and the air switch may be operated by blowing into the air tube. The air tube may be coupled to a whistle for actuating the air switch and emitting

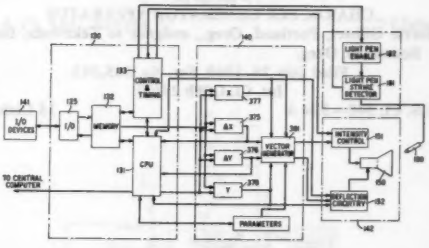


an audible signal simultaneously. The control circuit may include a time delay circuit which prevents actuation of the clock for a predetermined period of time after the first input stimulus is applied. The transmitter-air switch combination may be carried by the operator, as for example a referee at a hockey game.

3,651,508
SYSTEM FOR EVALUATING LIGHT PEN STRIKES

Paul Edward Scarborough, Jr., Burlington, and David Stuckey Watson, Winston Salem, both of N.C., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 23, 1970, Ser. No. 91,842
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 9 Claims



Data processing apparatus and methods for identifying a point on a continuous displayed image are described. In the case of a continuous vector, an iterative sequence of pairs of decreasingly smaller vectors are generated and evaluated to detect the location of a light pen strike on the continuous vector. In particular, when a vector in the iterative sequence is detected which is found to have sufficiently small magnitude, the process is terminated and one end of that vector is considered to be the desired point.

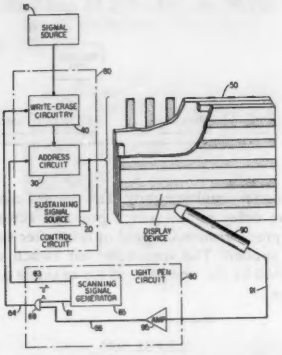
3,651,509
LIGHT PEN FOR DISPLAY HAVING INHERENT MEMORY

Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 6, 1970, Ser. No. 87,486
Int. Cl. G08b 5/22
U.S. Cl. 340—324 R 9 Claims

A light pen arrangement for display systems having inherent memory (e.g., plasma display systems) which operates in conjunction with display scanning signals for writing or erasing information on the display, such as for interactive graphics applications. The scanning signals generate momentary light pulses on the display which are detected by the light pen arrangement and used to selectively produce con-

ventional write or erase signals as the light pen is manipulated adjacent the display. The light pen arrangement can be



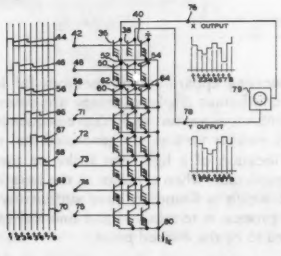
employed also to generate "store now-display later" information and to check existing display images.

3,651,510

CHARACTER GENERATOR APPARATUS

Barrie Gilbert, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed July 28, 1969, Ser. No. 845,393
Int. Cl. G08b *23/00*
U.S. Cl. 340—324 A **15 Claims**



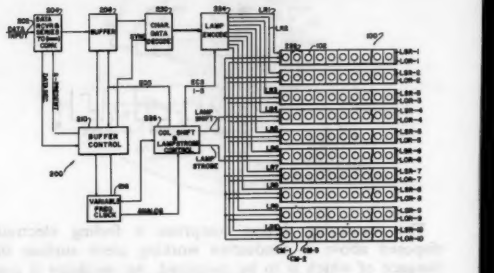
Sets of transistors each having a selectable number of emitters are employed for dividing current between the X and Y deflection means of an XY display device wherein each set of transistors defines a break point on a given alphanumeric character. Smooth transitions are made between each set of transistors and the next set, defining separate character break points, so as to generate a character stroke therebetween. Innumerable combinations of emitters are possible for generating different characters, each with a different group of transistor sets, and a large number of transistor sets for defining many characters are easily accommodated on a common integrated circuit structure.

3,651,511

TRAVELING MESSAGE DISPLAY

Russell W. Andrews, Chicago; Paul M. Kolesar, Hanover Park; Robert M. Payne, Des Plaines, and Howard G. Posner, Chicago, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Division of Ser. No. 703,057, Feb. 5, 1968, Pat. No. 3,493,956.
Filed Dec. 2, 1969, Ser. No. 881,546
Int. Cl. G09f *13/00*
U.S. Cl. 340—324 R **15 Claims**



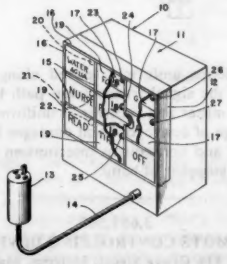
A completely electronic traveling message display system in which the input data is loaded into a buffer at the rate received and read out to a lamp encoder for actuating the lamps at a rate dependent on but nonsynchronous with the input rate. A control circuit determines the contents of the buffer and controls the readout rate so that a smooth transition is made in the visual display rate despite fast changes in the rate of input. A shift register is shown for sequentially enabling the lamps in a lamp matrix display board and the control circuit controls the shift rate through the register. Provisions are made to fire the lamps a controlled number of times for each shift of the shift register and only for a short period to prevent image distortions to the observer. The brightness of the display is both automatically and manually controllable to adjust for variations in the display rate and for ambient light conditions.

3,651,512

VISUAL DISPLAY COMMUNICATION APPARATUS FOR ENABLING A HANDICAPPED OR INFIRM INDIVIDUAL TO COMMUNICATE INFORMATION

George D. Summers, Bethesda, Md., assignor to Fairchild Industries, Inc., Montgomery County, Md.

Filed May 5, 1970, Ser. No. 34,749
Int. Cl. G08b *7/06*
U.S. Cl. 340—325 **15 Claims**



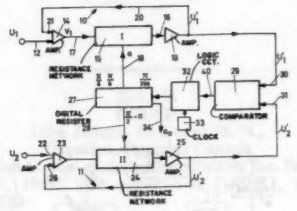
An apparatus for permitting a handicapped or infirm individual to visually communicate information including a display unit that has a display panel that has a series of compartments containing lamps and has translucent windows located

over the compartments that have messages or other similar information. An illuminating circuit is provided to cause sequential illumination of the lamps in either a vertical or horizontal direction upon receipt of appropriate input signals. Various control units are also provided for permitting a handicapped or infirm individual to readily transmit input signals to the illuminating circuit to cause sequential illumination of the lamps.

3,651,513
DATA-CONVERTING APPARATUS

Charles Meyer, St. Germain-en-Laye; Francois Maison, Eaubonne, and Paul Sangouard, Fontenay-le-Fleury, all of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Jan. 18, 1968, Ser. No. 698,762
Claims priority, application France, Jan. 20, 1967, 91,862
Int. Cl. G06g 7/22; G06j 1/00; H03k 13/00
U.S. Cl. 340—347 AD **6 Claims**



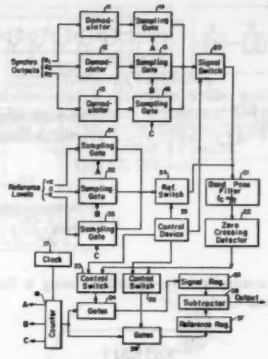
An analogue/digital converter includes a digital register for the storage of the magnitude of an angle a, this magnitude a and its complement $\pi/2-a$ being fed by respective outputs of the register to a pair of calculating networks each inserted between a first and a second amplifier stage. The first amplifier stage associated with either network receives an analogue signal in the form of a respective input voltage U_1, U_2 together with a degeneratively feed-back voltage U'_1, U'_2 from the corresponding output stage. The two first stages have the same gain G so that, if the combined gain of each network and its second amplifier stage is unity, $U'_1 = Ga(U_1 - U'_1)$ and $U'_2 = G(\pi/2 - a)(U_2 - U'_2)$ which for a value $G = 0.3534$, *yields the relationship* $U_2/U_1 - \tan a$ whenever $U'_1 = U'_2$. This identity can be established by a comparator, connected to the two second-stage outputs, which feeds back an error signal to the digital register to modify the value of a until the two output voltages are equal. Conversely, with $U_1 = U_2$, tan a equals the ratio of voltages $U'1$ to U'_2 which are therefore proportional to sin a and cos a, respectively.

3,651,514
SYNCHRO-TO-DIGITAL CONVERTER

Robert Walter Klatt, Glastonbury, Conn., assignor to Fairchild Industries, Inc., Farmingdale, L.I., N.Y.

Filed Mar. 25, 1970, Ser. No. 22,585
Int. Cl. H03k 13/02
U.S. Cl. 340—347 SY **16 Claims**

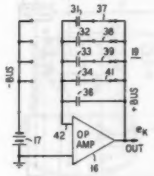
A synchro-to-digital converter in which the synchro output signals are demodulated and successively sampled and the samples combined to provide a sinusoidal waveform, the phase of which depends upon the angle of the synchro rotor. The phase difference between this sinusoidal waveform and a reference signal is measured by a digital counter which provides a digital readout which corresponds to the angle of the synchro rotor.



3,651,515
CAPACITIVE SWITCHED GAIN RATIO OPERATIONAL AMPLIFIER PCM DECODER

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 25, 1969, Ser. No. 879,783
Int. Cl. H03k 13/02
U.S. Cl. 340—347 DA **7 Claims**



A self-companding pulse code modulation converter employs switched gain ratio of an operational amplifier. Capacitors, weighted to correspond to the quantizing characteristic, are switched between the input and feedback circuits of an operational amplifier to change the gain ratio.

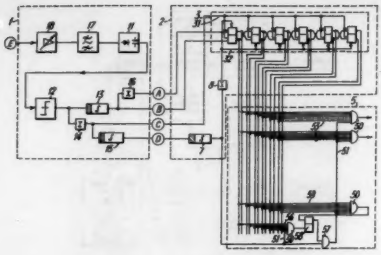
3,651,516
CODE CONVERTER

John Hugh Andreae, London, England, assignor to Standard Telephones and Cables Limited, London, England

Filed Mar. 2, 1970, Ser. No. 15,423
Claims priority, application Great Britain, Mar. 7, 1969, 12,223/69
Int. Cl. H04l 3/00
U.S. Cl. 340—347 DD **5 Claims**

This invention relates to a code converter which converts a variable length serial code (such as a code of the Morse Code type) into a fixed length parallel code. It temporarily stores a representation of each input code group in a shift register provided with a "dummy 1" which is shifted along the register in front of any received code group so as to indicate

its length. The code converter forms part of a selector which can be attached to an electrically operated typewriter to enable it to be controlled by dictation using a form of code similar to Morse Code.

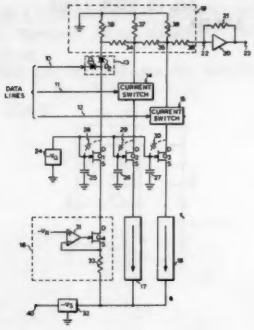


3,651,517

DIGITAL-TO-ANALOG CONVERTER WITH ISOLATED CURRENT SOURCES

Nicholas B. Kurek, Granada Hills; James F. Gruder, Manhattan Beach, and Dan Cameron, Jr., Woodland Hills, all of Calif., assignors to Information International, Inc., Boston, Mass.

Filed July 13, 1970, Ser. No. 54,490
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA **10 Claims**



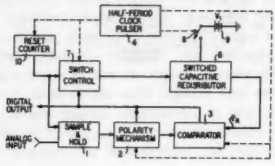
A digital-to-analog converter is disclosed employing a binary weighted current divider connected to the summing junction of an operational amplifier. Current switches selectively couple constant current sources to junctions in the current divider in accordance with binary digits at data input terminals. Each of the current sources consist of an operational amplifier having its output connected to the gate of a field-effect transistor (FET). The source of the FET is connected to a regulated power supply through a high resistance resistor and the drain of the FET is connected to a current switch through an isolation FET having its gate connected to circuit ground by a source of bias voltage and a filter capacitor in parallel. By controlling the regulated voltage to current sources, the analog output signal may be multiplied by a factor to form a product proportional to NS, where N is the number being converted and S is the control signal for the regulated voltage.

3,651,518

REDISTRIBUTION CIRCUIT FOR ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERSION AND MULTILEVEL PRE-EQUALIZERS

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 11, 1970, Ser. No. 18,447
Int. Cl. H03k *13/12*
U.S. Cl. 340—347 AD **7 Claims**



Each of a plurality of capacitors is charged to a weighted reference charge or discharged in response to digital information. At a subsequent time, all capacitors are connected in parallel and charge redistributes among them. The redistribution voltage which thereby settles across the parallel combination corresponds to an analog sample voltage.

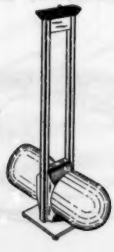
DESIGNS

MARCH 21, 1972

223,135
PILLOW
Cornelia R. Nash, 291 Leicester, Detroit, Mich. 48202
Filed July 22, 1970, Ser. No. 24,067
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D3—9

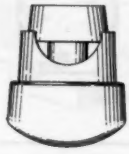
223,136
BRUSH
John Jedora, 33 Cedar St. N., Timmins, Ontario, Canada
Continuation-in-part of design application Ser. No. 20,141, Nov. 17, 1969. This application Dec. 21, 1970, Ser. No. 26,733
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15

223,137
SHOE POLISHER MACHINE
William A. Beck, River Hills, Wis., assignor to Beck, Inc., Grafton, Wis.
Filed Nov. 2, 1970, Ser. No. 25,760
Term of patent 14 years
Int. Cl. D4—*03*
U.S. Cl. D4—37



223,138
TAG ATTACHER
Robert P. Mulholland, Centerville, Ohio, assignor to The Monarch Marking System Company, Dayton, Ohio
Filed Sept. 30, 1970, Ser. No. 25,678
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

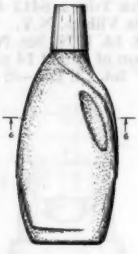
223,139
DOOR KNOB SAFETY LATCH FOR AUTOMOBILES
Frederick Trinca, 6412 83rd St., Middle Village, N.Y. 11379
Filed Oct. 14, 1970, Ser. No. 25,488
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—109



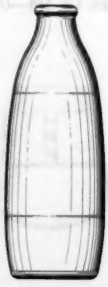
223,140
DOOR KNOB SAFETY LATCH FOR AUTOMOBILES
Frederick Trinca, 6412 83rd St., Middle Village, N.Y. 11379
Filed Oct. 14, 1970, Ser. No. 25,489
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—109

223,141
JUG OR SIMILAR ARTICLE
Earl E. Gilkeson, Carnegie, William C. Waterloo, York, and Richard L. Kennedy and Raymond E. Kennedy, Birdsboro, Pa., assignors to Graham Engineering Corporation, York, Pa.
Filed Oct. 26, 1970, Ser. No. 25,633
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—41

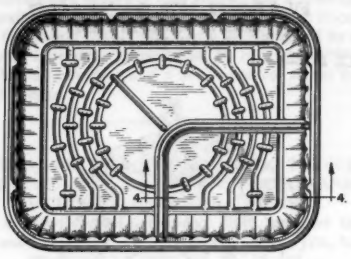
223,142
JUG OR SIMILAR ARTICLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Original design application Nov. 14, 1969, Ser. No. 20,093, now Patent No. 219,954, dated Feb. 23, 1971. Divided and this application May 25, 1970, Ser. No. 23,178
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—45



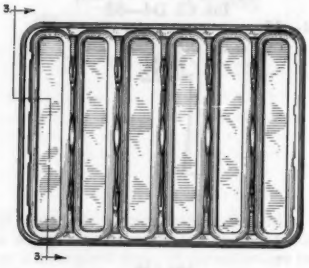
223,143
BOTTLE
Kurt Becker, Obernkirchen, Germany, assignor to Hermann Heye, Allee, Germany
Filed Aug. 26, 1970, Ser. No. 24,697
Claims priority, application Germany Mar. 6, 1970
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—135



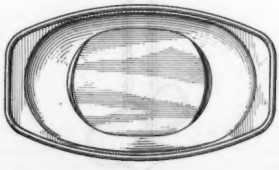
223,144
FOOD PACKAGING TRAY
Roy W. Bloch, Northbrook, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Sept. 14, 1970, Ser. No. 24,985
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



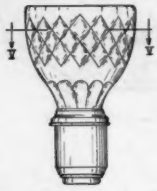
223,145
PACKAGING CONTAINER FOR COMESTIBLES OR THE LIKE
Roy W. Bloch, Northbrook, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Oct. 28, 1970, Ser. No. 25,689
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189



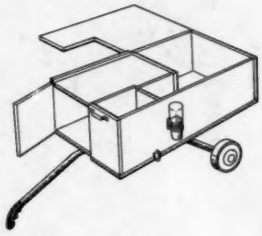
223,146
PACKAGING CONTAINER
Gunter Maasshoff, Glenview, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Oct. 8, 1970, Ser. No. 25,390
Term of patent 14 years
Int. Cl. D9—*03*; D7—*01*
U.S. Cl. D9—219



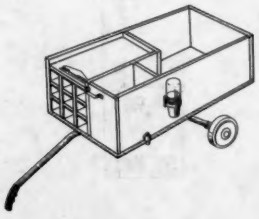
223,147
STOPPER FOR BOTTLE
Franklin Douglas Northgrave, Arva, Ontario, and Samuel Joseph Cino, Hamilton, Ontario, Canada, assignors to London Winery Limited, London, Ontario, Canada
Filed Oct. 22, 1970, Ser. No. 25,601
Claims priority, application Canada Feb. 16, 1970
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—285



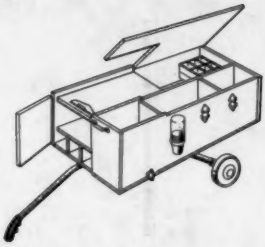
223,148
PORTABLE PICNIC CART
Ralph A. Gonzalez, 2114 Heloise Way, Placentia, Calif. 96270
Filed July 27, 1970, Ser. No. 24,158
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3



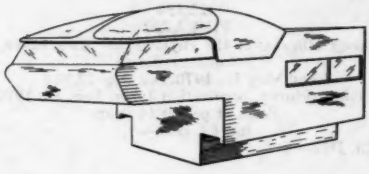
223,149
PORTABLE BASEBALL CART
Ralph A. Gonzalez, 2114 Heloise Way, Placentia, Calif. 96270
Filed July 27, 1970, Ser. No. 24,161
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3



223,150
PORTABLE FISHING CART
Ralph A. Gonzalez, 2114 Heloise Way, Placentia, Calif. 96270
Filed July 27, 1970, Ser. No. 24,162
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3



223,151
CAMPER
Grant W. Stroud, 920 21st St., Lewiston, Idaho 83501
Filed Oct. 16, 1970, Ser. No. 25,530
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3

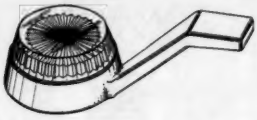


223,152
BEVERAGE SERVING CART
Fred Kauffman, Philadelphia, Pa., and Donald C. Siverts, Torrance, Calif., assignors to Hitco
Filed Oct. 30, 1970, Ser. No. 25,745
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3

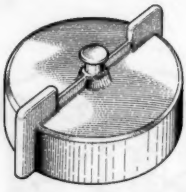
223,153
FIREARM
Kenji Murakami, 458 Hiyoshi-cho, Kohoku-ku, Yokohama, Japan
Filed May 11, 1970, Ser. No. 22,913
Claims priority, application Japan Feb. 14, 1970
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—6

223,154
FIREARM
Kenji Murakami, 458 Hiyoshi-cho, Kohoku-ku, Yokohama, Japan
Filed May 11, 1970, Ser. No. 22,914
Claims priority, application Japan Feb. 14, 1970
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—6

223,155
HANDLE FOR A PLUMBING FITTING
Joseph William Owings, Jeffersonville, Ind., assignor to American Standard Inc., New York, N.Y.
Filed Sept. 3, 1970, Ser. No. 24,820
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29

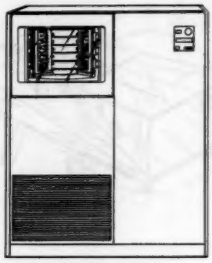


223,156
THREAD PROTECTOR CLOSURE CAP
Duncan Horatio Campbell, Etobicoke, Ontario, Canada, assignor to Wilson & Cousins Co. Limited, Brampton, Ontario, Canada
Filed Nov. 30, 1970, Ser. No. 26,230
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41

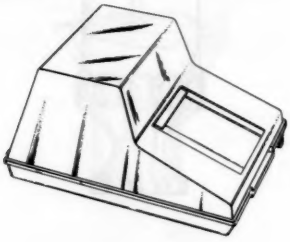


223,157
OUTDOOR INCINERATOR
Phillip G. Larue, Bay City, Mich., assignor to Calcinator Corporation, Bay City, Mich.
Filed Nov. 16, 1970, Ser. No. 26,007
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—85

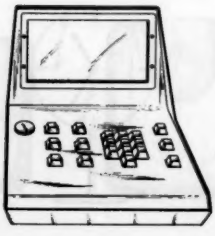
223,158
MAGNETIC DISK, FIXED HEAD FILE
Edward D. Lucey, Los Gatos, and Dallas G. Molerin, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 30, 1970, Ser. No. 21,172
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



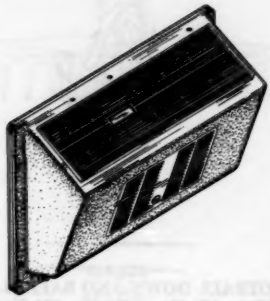
223,159
FORM READER
Demosthenis Chryssopoulos and George F. Minka, Torrance, Calif., assignors to TRW Data Systems, Inc., Torrance, Calif.
Filed Oct. 21, 1970, Ser. No. 25,581
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



223,160
DATA TERMINAL
Dan Nelson and John C. Hutton, Los Angeles, Calif., assignors to TRW Data Systems, Inc., Torrance, Calif.
Filed Oct. 21, 1970, Ser. No. 25,569
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



223,161
MULTIPLE STEREO SPEAKER UNIT FOR AUTOMOTIVE USE
Jonas H. Anchel, Milford, Pa., assignor to Sparkomatic Corporation, Milford, Pa.
Filed Oct. 28, 1970, Ser. No. 25,699
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



223,162
OWL FIGURE
Harry Meth, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Oct. 26, 1970, Ser. No. 25,668
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

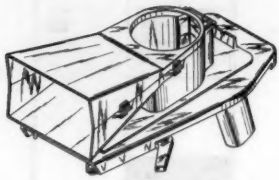
223,163
UTILITY TABLE
Arthur S. Gray, 1115 Carlyle Drive, San Mateo, Calif. 94402
Filed May 25, 1970, Ser. No. 23,146
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14

223,164
TOY DOG FIGURE
Harry Meth and Susan Lake, Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Oct. 26, 1970, Ser. No. 25,669
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2

223,165
FOOTBALL DOWN AND BALL MARKER
Michael B. Komendat, Jr., 524 Plum St., Fairport Harbor, Ohio 44077
Filed Sept. 22, 1970, Ser. No. 25,146
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,166
SKI BOB
Dieter E. W. Kuntz, 859 Cortez St., Costa Mesa, Calif. 92626
Filed Sept. 29, 1970, Ser. No. 25,245
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

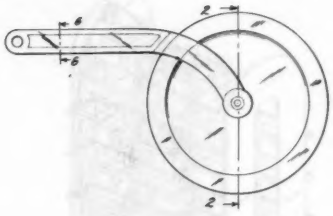
223,167
TOY PROJECTOR
Anthony D. Miller, Torrance, Derek J. Gay, Palos Verdes Peninsula, and William H. Smedley, Garden Grove, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 2, 1970, Ser. No. 25,762
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,168
GOBLET
Mary Jane Winans, Glendale, Calif., assignor to Interpace Corporation, Parsippany, N.J.
Filed Nov. 23, 1970, Ser. No. 26,109
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8

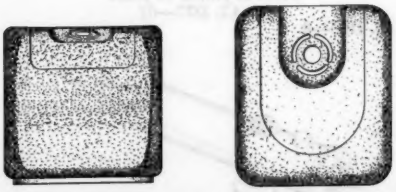
223,169
CLOCK OR SIMILAR ARTICLE
Mark Wallach, 220 E. 63rd St., New York, N.Y. 10021
Filed Mar. 2, 1970, Ser. No. 21,686
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

223,170
PASTRY CUTTER
Ernest J. Camos, 9078 Villaridge Court, St. Louis, Mo. 63123
Filed June 1, 1970, Ser. No. 23,249
Term of patent 7 years
Int. Cl. D7—*99*
U.S. Cl. D44—1

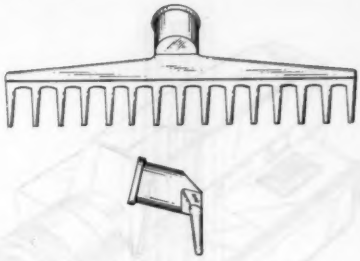


223,171
ELECTRIC BEVERAGE HEATER
Alfred W. Madl, Glendale, Wis., assignor to John Oster Manufacturing Co., Milwaukee, Wis.
Filed June 18, 1970, Ser. No. 23,555
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—26

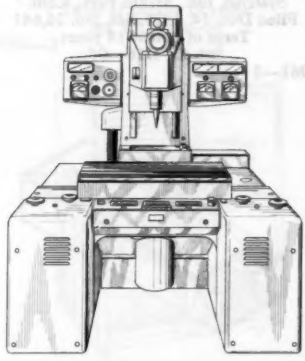
223,172
TABLE CIGARETTE LIGHTER
Dieter Rams, Konigstein, Taunus, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed Nov. 18, 1970, Ser. No. 26,050
Claims priority, application Germany May 25, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27



223,173
VACUUM CLEANER NOZZLE
Sol Howard and Robert Schaaf, Brooklyn, N.Y., assignors to Air Filters, Inc., Brooklyn, N.Y.
Filed Dec. 4, 1970, Ser. No. 26,295
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—18

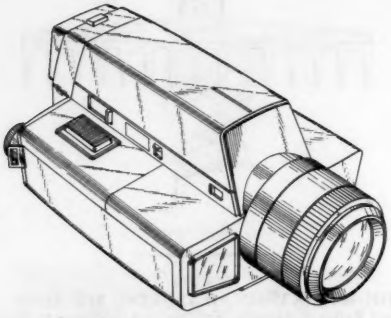


223,174
HIGH PRECISION MEASURING MACHINE
Jacques Pettavel, Geneva, Switzerland, assignor to Societe Genevoise d'Instruments de Physique
Filed Nov. 16, 1970, Ser. No. 25,995
Claims priority, application Switzerland May 19, 1970
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D55—1

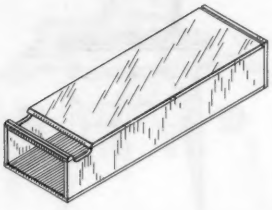


223,175
BIFOCAL SPECTACLES ELEVATOR
Charles I. Stoloff, 46 E. 91st St., New York, N.Y. 10028
Filed Sept. 28, 1970, Ser. No. 25,218
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

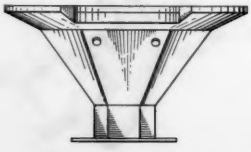
223,176
MOTION PICTURE CAMERA
Samuel F. Swayze, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sept. 8, 1970, Ser. No. 24,890
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



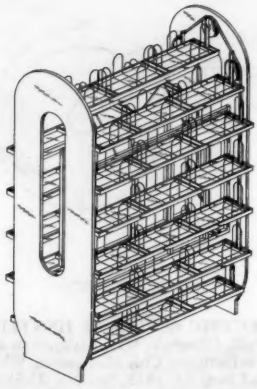
223,177
FILM STRIP CARTRIDGE
Bram Kool, Saratoga, Calif., assignor to Microform Data Systems, Inc., Menlo Park, Calif.
Filed Dec. 24, 1970, Ser. No. 26,641
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1



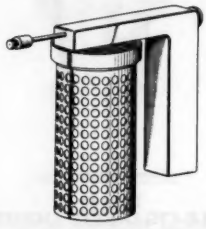
223,178
DISPLAY STAND
Charles E. Broudy, Penn Valley-Narberth, Pa., assignor to Henry I. Siegel Co., Inc., New York, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,824
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



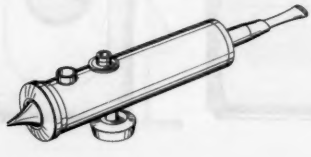
223,179
COMBINED DINING AND COOKING TABLE
Ron Shimosawa, Chicago, Ill., assignor to Kiku Co., Chicago, Ill.
Filed June 19, 1970, Ser. No. 23,575
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10



223,180
CRYOSURGICAL INSTRUMENT
Michael D. Bryne, Vernon, Conn., assignor to Brymill Corp., Vernon, Conn.
Filed Oct. 19, 1970, Ser. No. 25,553
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

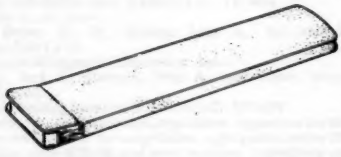


223,181
SMOKING PIPE
John R. Shepard, 1511 Gregory St., San Diego, Calif. 92102
Filed Nov. 19, 1970, Ser. No. 26,077
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8

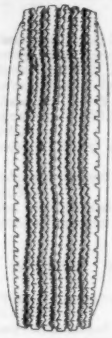


223,182
BOOTJACK
Freda L. Powell, Northbrook, Ill. (Rte. 5, Box 335B, Benton, Ky. 42025)
Filed Feb. 2, 1970, Ser. No. 21,198
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10

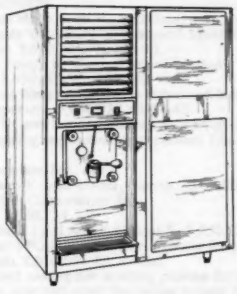
223,183
COMBINED UMBRELLA AND SHEATH
Manfred Bremshey, Mount Royal, Quebec, Canada, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Continuation-in-part of design application Ser. No. 14,441, Nov. 13, 1968. This application Jan. 21, 1970, Ser. No. 21,017
Claims priority, application Canada June 5, 1968
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



223,184
AUTOMOBILE TIRE
Paul J. Felker, Marshfield, Wis., assignor to Penetred Corporation, Marshfield, Wis.
Filed Jan. 26, 1970, Ser. No. 21,069
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



223,185
SEMI-FROZEN PRODUCT DISPENSER, OR SIMILAR ARTICLE
Robert B. Hartley, Columbia Heights, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Nov. 9, 1970, Ser. No. 25,900
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3



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TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF MARCH, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAI Corporation: *See—*
Abbott, David D.; and Barr, Irwin R., 3,650,213.

Aaron, Joseph E.: *See—*
Hardie, Waldo R.; and Aaron, Joseph E.,3,651,090.

AB C. J. Wennbergs Mekaniska Verkstad: *See—*
Andersson, Bengt Ivar, 3,650,935.

AB Jarnforadling: *See—*
Wennstrom, Elof Algot, 3,650,553.

Abarotin, Eugene V.; Nicely, Thomas E.; and Wilshire, Robert A., Jr., to United States Steel Corporation. Apparatus for withdrawing a casting from a mold. 3,650,315, Cl. 164-274.

Abbott, David D.; and Barr, Irwin R., to AAI Corporation. Frangible filled-projectile ammunition. 3,650,213, Cl. 102-38.

Abbott, John F. Remote controlling device. 3,651,507, Cl. 340-323.

Abbott Laboratories: *See—*
Crovetti, Aldo Joseph; and Von Esch, Anne Mary, 3,651,054.
Goldstein, Alma W.; and Prokop, Joseph F., 3,651,217.
Lex, Charles George, 3,651,048.

Abbott, Randle Leslie. Lubrication system for change-speed epicyclic gearing. 3,650,353, Cl. 184-6.12

Abe, Kimihiko: *See—*
Hata, Toju; Matsumae, Akihiro; Abe, Kimihiko; Sano, Yoshimoto; Ohtani, Mariko; and Ohmura, Satoshi,3,650,904.

Abe, Matazo, to Takeda Chemical Industries, Ltd. Rugulovasine. 3,651,220, Cl. 424-122.

Abe, Takashi: *See—*
Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; and Abe, Takashi,3,650,916.

Abex Corporation: *See—*
Adams, Cecil E.; and Dillon, Leo H., 3,650,291.

Abler, Roger L.: *See—*
Strand, David L.; and Abler, Roger L.,3,650,956.

A B Ludvig Svensson: *See—*
Bergholtz, Niels Rudolf, 3,650,676.

Abowd, Richard G., Jr.: *See—*
Unick, Alvin J.; and Abowd, Richard G., Jr.,3,650,711.

Abrahamsson, Sixten. Time interval generating apparatus. 3,651,486, Cl. 340-172.5

ACF Industries, Incorporated: *See—*
Kunz, Eugene L.; and Bolte, Ronald P., 3,650,293.

Ackerman, Joseph F.: *See—*
Weisfeld, Joseph; Tringali, Alfred M.; Ackerman, Joseph F.; and Bernardo, Joseph J.,3,650,997.

Adams, Cecil E.; and Dillon, Leo H., to Abex Corporation. Combination relief and shuttle valve. 3,650,291, Cl. 137-491.

Adams, John A., Jr.: *See—*
Lee, Ernest O., Jr.; Adams, John A., Jr.; and Budrys, Ignas,3,651,270.

Addressograph-Multigraph Corporation: *See—*
Burger, Jack E.; Deutsch, Fritz A.; and Howe, Warren B., 3,650,204.

Adler, Louis. Folding footstool. 3,650,562, Cl. 297-439.

Adler, Stanford L., to Technicon Corporation. Apparatus for the automatic determination of the coagulation, aggregation and/or flocculation, or like, rates of fluids, and novel reaction- intensifying agent for use therewith. 3,650,698, Cl. 23-253.

Advanced Geophysics, Inc.: *See—*
Owen, Robert L.; and Busby, Julian M., 3,651,395.

Advanced Instruments, Inc.: *See—*
Alessi, Patrick A.; and Jansky, Joel W., 3,650,038.

Advanced Technology Center, Inc.: *See—*
Boatner, Lynn A.; and Sewell, Kenneth G., 3,651,426.
Sewell, Kenneth G., 3,651,423.
Underhill, Michael James; and Sw6660 Sewell, Kenneth G., 3,651,422.

Aepli, Otto T.: *See—*
Sedliar, Ronald M.; Garvin, Donald F.; and Aepli, Otto T.,3,650,964.

Aerojet-General Corporation: *See—*
Andrews, Donald W.; Kessler, Eugene L.; and Newton, Roland A., 3,650,337.
Binnings, Gerald F.; Meyer, Theodore N.; and Riley, Mel J., 3,650,437.

AFA Corporation of Florida, The: *See—*
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AGA Aktiebolag: *See—*
Beer, Palle-Finn, 3,650,699.

Agfa-Gevaert Aktiengesellschaft: *See—*
Huber, Hans-Peter, 3,650,751.
Ohlschlager, Hans; and Riester, Oskar, 3,650,756.
Platz, Stephen; Peter, Leverkusen; and Gref, Hans, 3,650,292.

Aggen, George, to Allegheny Ludlum Steel Corporation. Ferritic stainless steel. 3,650,731, Cl. 75-128.

Ahle, James L.: *See—*
Doyle, William C., Jr.; and Ahle, James L.,3,650,728.

Air Reduction Company, Incorporated: *See—*
Moen, Walter B.; and Spies, George R., 3,650,290.
Rhum, David; and Weintraub, Lester, 3,651,020.

Airola, Aito Kasimir; and Saarinen, Martti Kaarolo Johannes, to Oy Airam AB. Mercury dosage device. 3,650,304, Cl. 141-2.

Aisin Seiki Company Limited: *See—*
Inada, Masami; Hayashi, Tatsuo; and Takayama, Katuki, 3,650,573.
Okamoto, Toshiaki; Inada, Masami; and Mori, Koziro, 3,650,574.

Aisin Seiki Kabushiki Kaisha: *See—*
Kawabe, Tsuneo; Miyake, Hirotaka; and Ban, Masasi, 3,650,569.

Ajar, Charles. Motion picture projector soundtrack movement. 3,650,610, Cl. 352-31.

Akano, Akimi: *See—*
Inouye, Ryuichiro; Nishikawa, Manaka; and Akano, Akimi,3,650,981.

Akers, Edward G., to Borg-Warner Corporation. Self-sealing tank connector. 3,650,551, Cl. 285-158.

AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See—*
Gorike, Rudolf; and Lemoch, Karl, 3,651,286.

Akimoto, Hideo: *See—*
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Akiyama, Hideaki: *See—*
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Aktiebolaget Tudor: *See—*
Sundberg, Erik G., 3,650,833.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Faust, Werner, 3,651,374.

Akzona Incorporated: *See—*
Munting, Johannes Pieter, 3,650,879.
Stapp, Hans, 3,650,659.

Albert, Robert J.; and Hoge, John H., said Hsge, assor. ts said Ahbert, Robert J. Aggregate containing a treatment agent for improving concrete properties. 3,650,784, Cl. 106-90.

Aldridge, Anthony Peter, to Simon-Carves Limited. Treatment of biological sludge. 3,650,403, Cl. 210-180.

Alessi, Patrick A.; and Jansky, Joel W., to Advanced Instruments, Inc. Article treating apparatus. 3,650,038, Cl. 34-45.

Alexeff, Alexander V.; and Snyder, Harvey, to Alexeff-Snyder Enterprises, Inc. Web guiding and expanding apparatus. 3,650,000, Cl. 26-65.

Alexeff-Snyder Enterprises, Inc.: *See—*
Alexeff, Alexander V.; and Snyder, Harvey, 3,650,000.

Allegheny Ludlum Steel Corporation: *See—*
Aggen, George, 3,650,731.
Kindlimann, Lynn E.; and Ansell, George S., 3,650,729.

Allen, Edward M., to PPG Industries, Inc. Process for preparing pigmentary metal oxide. 3,650,694, Cl. 23-202.

Allen, Lloyd R. Hybrid casting-hot working process for shaping magnesium, aluminum, zinc and other die casting metals. 3,650,312, Cl. 164-55.

Allen-Bradley Company: *See—*
Kosen, Marion, 3,651,314.
McMartin, William J.; and Weidmann, Hans E., 3,651,400.

Alley, Raymond L., to American Warming & Ventilating, Inc. Fire damper blade latch. 3,650,069, Cl. 49-7.

Allied Chemical Corporation: *See—*
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F., 3,651,105.
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Baltakmens, Gotlibs; and Tourish, John P., 3,650,969.
Flanner, Lloyd T., 3,650,982.
Khan, Aziz Urrehman; Price, Alson Kay; and Sweeney, Richard Francis, 3,651,073.
Schaffhauser, Robert J.; and Parris, Chester L., 3,651,011.
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Sweeney, Richard F.; and Price, Alson K., 3,651,069.

Allis-Chalmers Manufacturing Company: *See—*
Manion, Jean P.; Philosophos, John A.; and Robinson, Marquis B., 3,650,955.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Sodergard, Bengt Martin, 3,650,895.

Alloys and Chemicals Corporation: *See—*
Derham, Leslie Jack, 3,650,730.

Allport, Davies, to Cubic Corporation. Traveling cylinder imprinter with over center platen cylinder activating mechanism. 3,650,209, Cl. 101-269.

Alpers, Frederick C., to United States of America, Navy. Image stabilization system. 3,651,325, Cl. 250-203.

Alpers, Frederick C., to United States of America, Navy. Passive electro-optical seeker. 3,651,326, Cl. 250-203.

Alpine Chemische Aktiengesellschaft: *See—*
Hrach, Josef; and Wimmer, Theodor, 3,651,016.

Aluminum Company of America: *See—*
Lee, Richard G.; Schleicher, Allen K.,; Panzer, Max L.; and Brock, John E., 3,650,566.

Aluminum Converter Sales & Research, Inc.: *See—*
Graveman, Fred J., 3,650,012.

Amano, Hiroyuki; Tsuji, Nobuo; Miyazako; Shirasu, Kazuo; and Tutiya, Yosinori, to Fuji Photo Film Co. Whitened photographic printing paper. 3,650,752, Cl. 96-82.

A. Menarini S.A.S.: *See—*
Ghelardoni, Mario; and Russo, Filippo, 3,651,133.

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Kinkel, Christian F., 3,650,006.

American Cyanamid Company: *See—*
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Kelly, Robert Gerard; and Ellenbogen, Leon, 3,651,236.
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Padmanathan, Thurairajah, 3,651,062.
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American Micro-Systems, Inc.: *See—*
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American Motors Corporation: *See—*
Marshall, Charles J., 3,650,256.

American Standard, Inc.: *See—*
White, Douglas F., 3,650,152.

American Warming & Ventilating, Inc.: *See—*
Alley, Raymond L., 3,650,069.

AMF Incorporated: *See—*
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Amforge, Inc.: *See—*
Broom, Robert F., 3,650,736.

Amici, Francis Robert; and Davis, Robert E., to Ideal Toy Corporation. Animated toy. 3,650,066, Cl. 46-129.

Amick, David W. Asymmetrical jet ejector. 3,650,637, Cl. 417-151.

Amicon Corporation: *See—*
Desaulniers, Charles W.; Ford, Cheryl A.; and Mayo, Richard W., 3,651,030.

Ammann, Stephen K., to Bessemer Securities Corporation, mesne. Method and apparatus for the formation of alpha- numerical characters on light sensitive surfaces. 3,651,258, Cl. 178-15.

Amodei, Juan Jose, to RCA Corporation. Information storage system employing optical entry and removal of information. 3,651,488, Cl. 340-173.

AMP Incorporated: *See—*
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Berezin, Evelyn; Wolf, Edgar; Cohen, William D.; and Marino, Francis C., to Digitronics Corporation. Information signal generation apparatus. 3,651,311, Cl. 235-61.11

Berg Electronics, Inc.: *See*—
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Berger, Dieter: *See*—
Genz, Heinz; Liborius, Heinz; Pfleiderer, Dieter; Schmidt, Karl; Berger, Dieter; and Seeliger, Horst,3,650,892.

Bergero, Ramon, to BSR Optronics Corporation. Electro-mechanical color reproduction system. 3,651,246, Cl. 178-5.2

Berghausen, Philip E.; Dehner, Gareth A.; and Morgan, John M., Jr., to Cincinnati Milacron Inc. Method and device for detecting contact between tool and workpiece of an ECM apparatus. 3,650,923, Cl. 204-143.

Bergholtz, Niels Rudolf, to A B Ludvig Svensson. Method for treating textile material with a circulating liquid. 3,650,676, Cl. 8-155.1

Bergmann, Gerhard, to Hoesch-Chemie G.m.b.H. Process for finishing cellulosic textile materials with n-methylol compounds. 3,650,671, Cl. 8x116.3

Bergstrom, Theodore R., to Minnesota Mining and Manufacturing Company. Bearing repair. 3,650,004, Cl. 29-149.5

Bergwerksverband G.m.b.H.: *See—*
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Berns, Peter M.; and Simonoff, Ely, to Opelike Manufacturing Corporation. Display holder for unpackaged textile items. 3,650,442, Cl. 223-87.

Bertolacini, Ralph J.; and Gutberlet, Louis C., to Standard Oil Company. Uranium-containing and aluminosilicate-containing hydrocarbon conversion catalyst and process. 3,650,945, Cl. 208-111.

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Beth, Donald; Saliaris, George P.; and Welch, Ralph A. Flat end casing system and method of use. 3,650,774, Cl. 99-174.

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Beutel, Robert C., to International Telephone and Telegraph Corporation. Secondary emission field effect charge storage system. 3,651,489, Cl. 340-173.

Bialous, Charles A., to General Electric Company. Thermally stable alkalin earth carbonate/ polytetrafluoroethylene modified polycarbonate composition. 3,651,174, Cl. 260-873.

Biber, Conrad H., to Polaroid Corporation. Low energy level electronic flash modulator. 3,650,189, Cl. 95-11.5

Biensan, Michel; and Bruant, Philippe, to Societe Nationale des Petroles d'Aquitaine tour Aquitaine. The anionic solution polymerization of lauroyl lactam. 3,651,024, Cl. 260-78.

Bierlein, John David, to Du Pont de Nemours, E. I., and Company. Magneto-optic device having alternate layer film structure. 3,650,601, Cl. 350-151.

Big Three Industrial Gas & Equipment Co.: *See—*
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Biggane, John D., to Superior Strut & Hanger Company. Clamp for pipe support with slanting pivotal assembly. 3,650,499, Cl. 248-62.

Binnings, Gerald F.; Meyer, Theodore N.; and Riley, Mel J., to Aerojet-General Corporation. Automated biological reaction instrument. 3,650,437, Cl. 222-136.

Binon, Fernand; and Descamps, Marcel Louis Victor, to Laboratoires Labaz. Benzo[b] benzofurano [2,3-e] oxepines. 3,651,051, Cl. 260-240.

Bio-Controls Corporation: *See—*
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Bishop, Richard Patten: *See—*
Brown, Louis Stanislaus; March, Frank Adams; Bishop, Richard Patten; and Gilman, Bruce Calvin,3,650,406.

Bissett-Berman Corporation, The: *See—*
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Black and Decker Manufacturing Company, The: *See—*
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Black, James A. Flat bed web press index and registration. 3,650,207, Cl. 101-115.

Blankenship, Ernest Bayne. Automatic incinerating urinal. 3,649,970, Cl. 4-131.

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Blume, Roe C.; and Seufert, Ludwig E., to Du Pont de Nemours, E. I., and Company. Process for producing phenol-aldehyde resin fibers. 3,651,199, Cl. 264-236.

Boatner, Lynn A.; and Sewell, Kenneth G., to Advanced Technology Center, Inc., mesne. Light-sensitive Gunn-effect device. 3,651,426, Cl. 331-107.

Bobb, John S. Stephen, to Philadelphia Quartz Company. Method of preparing silica sol and product thereof. 3,650,977, Cl. 252-313.

Bobylev, Alexei Vasilievich; Goryacheva, Kapitolina Arsenievna; and Chernikova, Alla Vasilievna. Non-magnetic copper-based alloy. 3,650,733, Cl. 75-153.

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Boden, Karl; and Scheffer, Dietrich, to Boden, Karl, Groth, Wilhelm, and Scheffer, Dietrich. Bearing systems. 3,650,581, Cl. 308-10.

Bodenheimer, Bert A., to Sea-Land Service, Inc. Vehicle carrier. 3,650,416, Cl. 214-10.5

Bodenheimer, David W.; and Paschetag, Elbert W., Jr., to LTV Electrosystems, Inc. Method and device for testing apparatus for susceptibility to magnetic field. 3,651,397, Cl. 324-34.

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Boers, Jan H.; Rutherford, Robert C.; and Loquai, John R., to Owatonna Tool Company. Limited slip differential disassembly method and tool therefor. 3,650,013, Cl. 29-427.

Bogdan, John R.; and Farmer, Alonzo, to PPG Industries, Inc.Method for treating TiO_2 reactor discharge containing products of nitrogen fixation. 3,650,695, Cl. 23-202.

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Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F.,3,651,105.

Bogomolov, Alexei Sergeevich. Method for linear acceleration of heavy charged particles and device for its realization. 3,651,417, Cl. 328-233.

Bohrer, Thomas C., to Celanese Corporation. Process and apparatus for start-up of fiber- spinning solutions. 3,651,194, Cl. 264-169.

Boichard, Jacques; Brossar, Bernard Pierre; Duroux, Jacques Marius; and Janin, Raymond Marc Clement, to Rhone-Poulenc S.A. Preparation of oxalic acid. 3,651,135, Cl. 260-533.

Boissier, Jacques R.; and Ratouis, Roger, to Societe Anonyme dite: Roussel-Uclaf, mesne. 17a,21 Alkenylidene dioxy derivatives of pregnane and process for preparation thereof. 3,651,049, Cl. 260-239.55

Boldt, Manfred; Arpe, Hans-Jurgen; and Hornig, Lothar, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of phenyl esters and phenol from benzene. 3,651,101, Cl. 260-410.5

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Bolte, Ronald P.: *See—*
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Bolton, Norman A.; and Frielinghaus, Klaus H., to General Signal Corporation. Vehicle traffic control system. 3,651,453, Cl.

Boon, George B., to Monsanto Company. Heat exchange device. 3,650,319, Cl. 165-88.

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Kimpel, Frank A.; and Markley, William F., 3,650,121.
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Root, Warren W.; and Frank, William W., 3,650,262.
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Bornemeier, Dwight D., to Sensors, Inc. System for inspecting and classifying objects such as screws, bolts and the like while in motion. 3,650,397, Cl. 209-80.

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Boschetti, Eugene; Molho, Darius; and Fontaine, Louis, to Lipha, Lyonnaise Industrielle Pharmaceutique. Derivatives of 4-hydroxy coumarin and the preparation thereof. 3,651,091, Cl. 260-343.2

Boschetti, Eugene; Molho, Darius; and Fontaine, Louis, to Lipha, Lyonnaise Industrielle Pharmaceutique. Anticoagulating compositions containing new derivatives of 4-hydroxy coumarine. 3,651,223, Cl. 424-275.

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Boswell, Gordon H., to Mason & Porter Limited. Oiling means. 3,650,355, Cl. 184-59.

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Bougaran, Marcel, to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme). Electrolytic, secondary and primary cells. 3,650,842, Cl. 136-134.

Bowden, Roy Dennis, to Imperial Chemical Industries Limited. Pyridine derivatives and the preparation thereof. 3,651,071, Cl. 260-296.

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Bredow, Walter, to Behrens, C., Aktiengesellschaft. Longitudinal carriage drive for co-ordinates tables in machine tools, particularly punching machines. 3,650,133, Cl. 72-1.

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Brehm, Hans, to Freudenberg, Carl. Device for the uniform application of small amounts of a powdery material onto surface configurations. 3,650,243, Cl. 118-308.

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Brignac, Edmond P.; Smith, Billy E.; Smith, Wallace W.; and Solo, Emilio J., to Monsanto Company. High-elongation-and-tenacity nylon tire yarn. 3,651,201, Cl. 264-290.

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Brown, Richard L. Hydraulically-actuatable elevator system. 3,650,356, Cl. 187-17.

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Bruton, Billy R.; and Locke, Joe B., to U.S. Industries, Inc. Safety relief valve. 3,650,288, Cl. 137-219.

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Burdette, George William; and Couch, Dean Henry, to United States of America, Navy. Gelled amine rocket fuels. 3,650,857, Cl. 149-36.

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Burghele, Thodor; Ichim, Vasile; and Demetrescu, Mihai, to Institutul de Medicina si Farmacie. Method and apparatus, including a flexible electrode, for the electric neurostimulation of the neurogenic bladder. 3,650,276, Cl. 128-419.

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Burr, Harvey, to Anaconda Wire and Cable Company. Marking apparatus and method. 3,650,862, Cl. 156-51.

Burriat, Jean; and Du Fort, Philippe, to Degremont, Societe Generale d'Epuration et d'Assainissement. Method and apparatus for the continuous regeneration of ion exchange resins. 3,650,948, Cl. 210-33.

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Cameron-McIndoo Limited: *See—*
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Campos, Adolph J. Automobile safety and anti-theft device. 3,650,347, Cl. 180-114.

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Carbrey, Robert L., to Bell Telephone Laboratories, Incorporated. Capacitive switched gain ratio operational amplifier PCM decoder. 3,651,515, Cl. 340-347.

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Case, John S.; and Johnson, William B., to Anchor Post Products, Inc., mesne. Method for continuous coating of metallic products with fusible pulverulent materials. 3,650,798, Cl. 117-21.

Casey, Richard H., to General Motors Corporation. Hydro-static bearing air seal. 3,650,582, Cl. 308-36.3

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Snow, Austin Matthew, Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing high-solids chloroprene polymer latex. 3,651,038, Cl. 260-92.3

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Valentine, David L., D. R. Leonard, A. D. Beeler. Plastisols of polyvinyl chloride and its copolymers. T896,039, 3–21–72, Cl. 260—23.

Vetter, Robert J. Paper materials impregnated with polysiloxanes. T896,046, 3–21–72, Cl. 117—138.8.

Wright, Donald L. Fish, oyster and crustacean food comprising particular proteins derived from hydrocarbons. T896,037, 3–21–72, Cl. 99—3.

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ISSUED MARCH 21, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

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159.22 3,650,928
159.24 3,650,927
164 3,650,929
177 3,650,930
180R 3,650,931
181 3,650,932
3,650,933
192 3,650,921
195 3,650,934
206 3,650,935
212 3,650,936
213 3,650,937
218 3,650,938
219 3,650,939
224 Re.27,312
3,650,940
243R 3,650,941

CLASS 206

1 3,650,378
1.5 3,650,379
1.8 3,650,380
45.11 3,650,381
45.14 3,650,382
45.31 3,650,383
45.34 3,650,384
46FN 3,650,385
46F 3,650,386
3,650,387
52F 3,650,388
53 3,650,389
56AA 3,650,390
3,650,391
56AC 3,650,392
63.2 3,650,393
65E 3,650,395
65S 3,650,394

CLASS 208

31 3,650,942
60 3,650,943
65 3,650,944
111 3,650,945
120 3,650,946

CLASS 209

3 3,650,396
80 3,650,397
80.5 3,650,398
3,650,399
111.5 3,650,400
325 3,650,401
430 3,650,402

CLASS 210

15 3,650,947
33 3,650,948
36 3,650,949
60 3,650,950
180 3,650,403
238 3,650,404
241 3,650,405
242 3,650,406

CLASS 211

14 3,650,407
57 3,650,408

CLASS 214

1CM 3,650,410
1QA 3,650,409
1QD 3,650,411
1.5 3,650,412
8.5F 3,650,414
10 3,650,415
10.5R 3,650,416
17DA 3,650,417
3,650,418
38B 3,650,419
44R 3,650,420
77 3,650,421
146.5 3,650,422
149 3,650,423
454 3,650,424
762 3,650,425

CLASS 215

9 3,650,426
13R 3,650,427
42 3,650,428

CLASS 219

10.53 3,651,299
10.55 3,651,300
10.75 3,651,301
70 3,651,302
121EB 3,651,303
200 3,651,304
233 3,651,306
243 3,651,305
505 3,651,307
3,651,308

CLASS 220

2.1R 3,650,429
23.8 3,650,430
42B 3,650,432
88R 3,650,431

CLASS 221

65 3,650,433

CLASS 222

31 3,650,434
52 3,650,435
70 3,650,436
136 3,650,437
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66 3,650,441
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CLASS 224

42.03A 3,650,443
42.42R 3,650,444

CLASS 225

93 3,650,445
97 3,650,446

CLASS 226

34 3,650,447
45 3,650,448
142 3,650,449

CLASS 227

67 3,650,451
3,650,452
138 3,650,453

CLASS 228

1 3,650,454
6 3,650,455
19 3,650,456
44 3,650,457
46 3,650,450

CLASS 229

17 3,650,458
23A 3,650,459
55 3,650,460
66 3,650,461
68R 3,650,462
81 3,650,463

CLASS 232

35 3,650,464

CLASS 233

13 3,650,465

CLASS 235

61B 3,650,466
61.11D 3,651,311
61.12 3,651,312
61.6A 3,651,309
61.7B 3,651,310
89R 3,650,467
112 3,651,313
151.11 3,651,314
151.31 3,651,315
152 3,651,316
183 3,651,318
197 3,651,317

CLASS 238

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264 3,650,469

CLASS 239

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333 3,650,473
418 3,650,474
419.3 3,650,475
431 3,650,476
490 3,650,477
516 3,650,478
527 3,650,479

CLASS 240

10.1 3,651,319
25 3,651,320
151 3,651,321

CLASS 241

28 3,650,480
46.11 3,650,481
153 3,650,482
186R 3,650,483
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245 3,650,485

CLASS 242

43 3,650,486
55.3 3,650,487
67.3 3,650,488
71.2 3,650,489
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86.7 3,650,492
118.3 3,650,493
118.61 3,650,494
192 3,650,495

CLASS 244

3.29 3,650,496
12CW 3,650,497

CLASS 248

18 3,650,498
62 3,650,499
125 3,650,500
146 3,650,501
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285 3,650,503
466 3,650,504

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43.5R 3,651,322
49.5ZC 3,651,323
201 3,651,324
203CT 3,651,326
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222R 3,651,328

CLASS 251

11 3,650,505
26 3,650,506
149.6 3,650,507
174 3,650,508

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8.5 3,650,951
33.6 3,650,952
49.9 3,650,953
63.2 3,650,954
66 3,650,955
79.1 3,650,957
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3,650,959
79.3 3,650,960
90 3,650,956
99 3,650,961
102 3,650,962
3,650,963
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3,650,965
3,650,966
135 3,650,967
142 3,650,968
143 3,650,969
181 3,650,970
182 3,650,971
186 3,650,972
301.2 3,650,973
301.4F 3,650,974
3,650,975
301.4 3,650,976
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431 3,650,985
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451 3,650,988
3,650,989
455Z 3,650,990
500 3,650,991

CLASS 259

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104 3,650,511

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2.5AM 3,650,994
2.5BD 3,650,993
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20 3,650,996
21 3,650,997
3,650,998
22D 3,650,999
28.5AS 3,651,000
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29.6 3,651,001
31.2XA 3,651,003
31.2N 3,651,004
31.2 3,651,005
33.2 3,651,006
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3,651,011
46.5R 3,650,852
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290HL 3,651,066
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87 3,650,513

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51 3,651,180
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54 3,651,183
56 3,651,184
89 3,651,185
94 3,651,186
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153 3,651,190
3,651,191
160 3,651,192
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23S 3,650,515
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3,650,518
34V 3,650,517
36H 3,650,519

CLASS 267

152 3,650,520

CLASS 269

41 3,650,521
228 3,650,522
328 3,650,523

CLASS 270

54 3,650,524

CLASS 271

29 3,650,525
48 3,650,526
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CLASS 272

57B 3,650,528
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79A 3,650,531

CLASS 273

1R 3,650,532
86G 3,650,533
134AE 3,650,534
143R 3,650,535

CLASS 274

4F 3,650,413
10S 3,650,539

CLASS 277

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160 3,650,537

CLASS 279

51 3,650,538

CLASS 280

124B 3,650,540
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150B 3,650,542
154.5 3,650,543
293 3,650,544
421 3,650,545
423 3,650,546

CLASS 285

3 3,650,547
3,650,548
3,650,549
55 3,650,550
158 3,650,551

CLASS 287

90R 3,650,552
130 3,650,553

CLASS 292

127 3,650,554
145 3,650,555

CLASS 296

23C 3,650,556
28A 3,650,558
28C 3,650,557
95R 3,650,559

CLASS 297

140 3,650,560
391 3,650,561
439 3,650,562
441 3,650,563

CLASS 299

11 3,650,564
86 3,650,565

CLASS 302

11 3,650,566
52 3,650,567

CLASS 303

2 3,650,568
6 3,650,569
7 3,650,570
10 3,650,571
15 3,650,572
21AF 3,650,574
21CF 3,650,575
21F 3,650,573

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10AT 3,651,329
64 3,651,330
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9 3,650,580
10 3,650,581
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230 3,650,583

CLASS 310

8.1 3,651,352
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10 3,651,354
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204 3,651,366
3,651,367

CLASS 315

13 3,651,369
18 3,651,370
102 3,651,371
134 3,651,372
241 3,651,373

CLASS 316

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3,651,384
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237 3,651,386
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CLASS 324

.5R 3,651,394
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CLASS 339

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CLASS 353

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120 3,651,218
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	3,651,220		3,651,228	311	3,651,235	71	3,650,645	206	3,650,652	408	3,650,030
180	3,651,221	250	3,651,229	317	3,651,236	78	3,650,646	218	3,650,653	418	3,650,658
185	3,651,222	251	3,651,230	319	3,651,237	109	3,650,647	243	3,650,654	461	3,650,659
200	3,651,224	267	3,651,232	330	3,651,088	129	3,650,648			CLASS 431	
	3,651,225	274	3,651,233		CLASS 425	131	3,650,649	289	3,650,655	254	3,650,660
226	3,651,226	275	3,651,223	66	3,650,644	153	3,650,650	387	3,650,656	328	3,650,661
238	3,651,227	277	3,651,234			197	3,650,651	389	3,650,657	329	3,650,662

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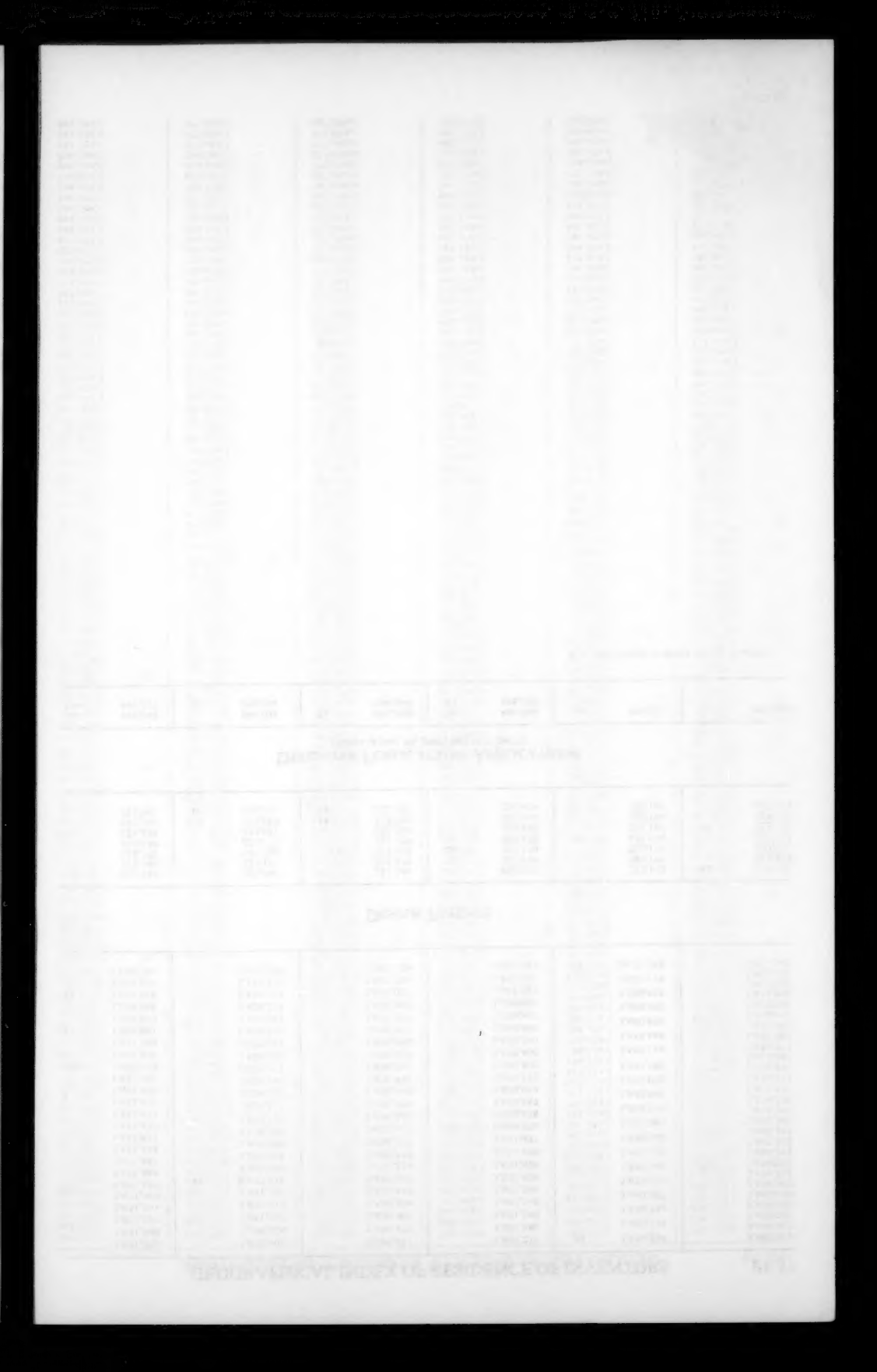

U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*